

Modeling at MAG

Socioeconomic Modeling

**Planners Stakeholders Group
August 29, 2006**

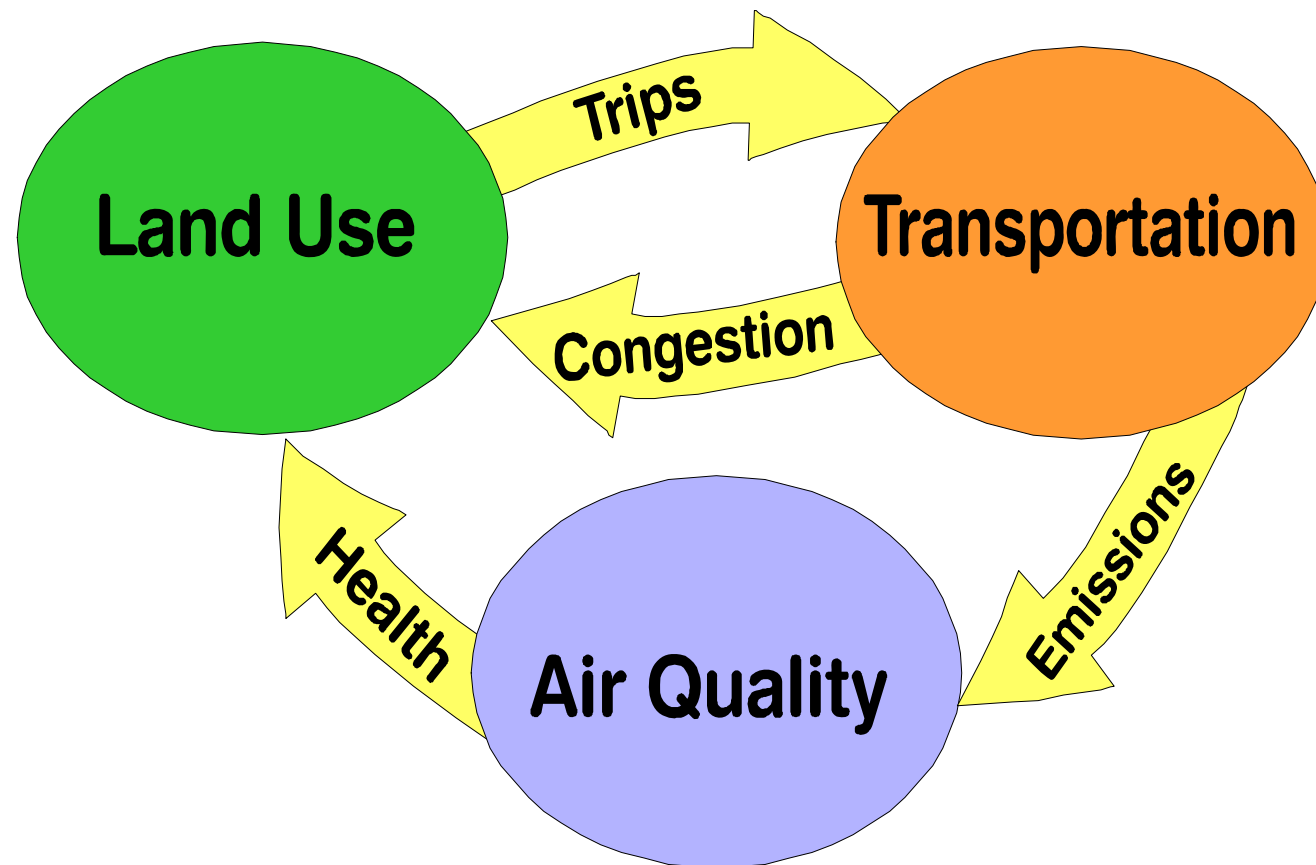


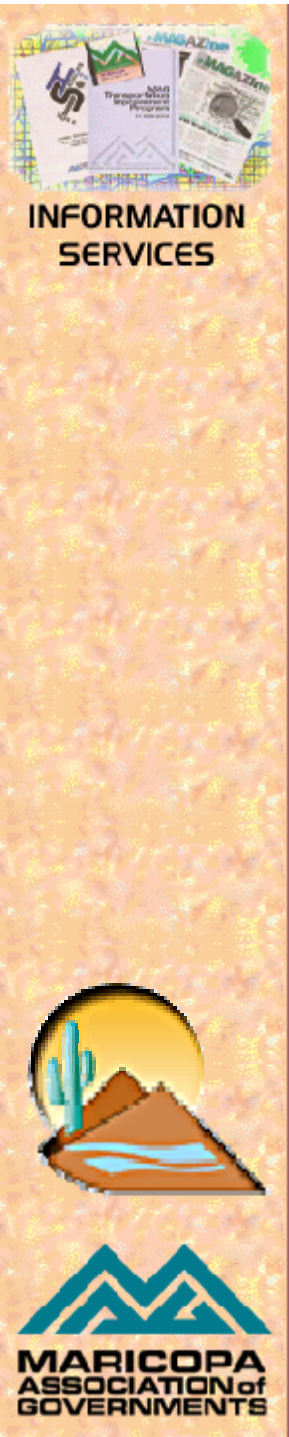
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Metropolitan Planning Organization and Air Quality Planning Agency for the Region

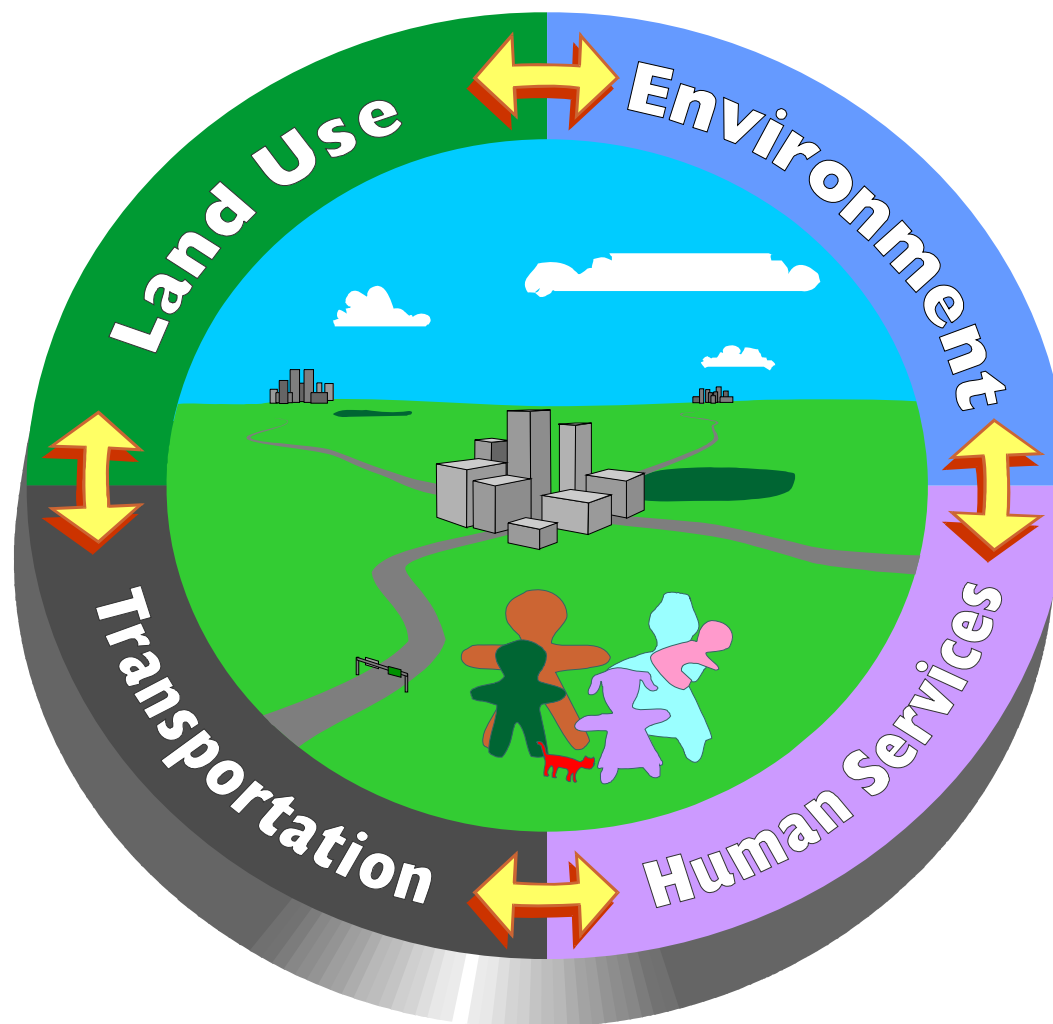


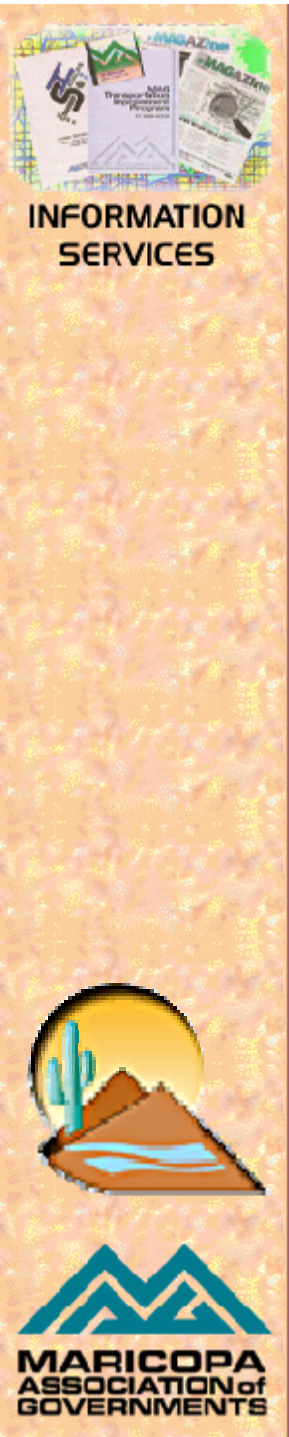


Executive Order 95-2

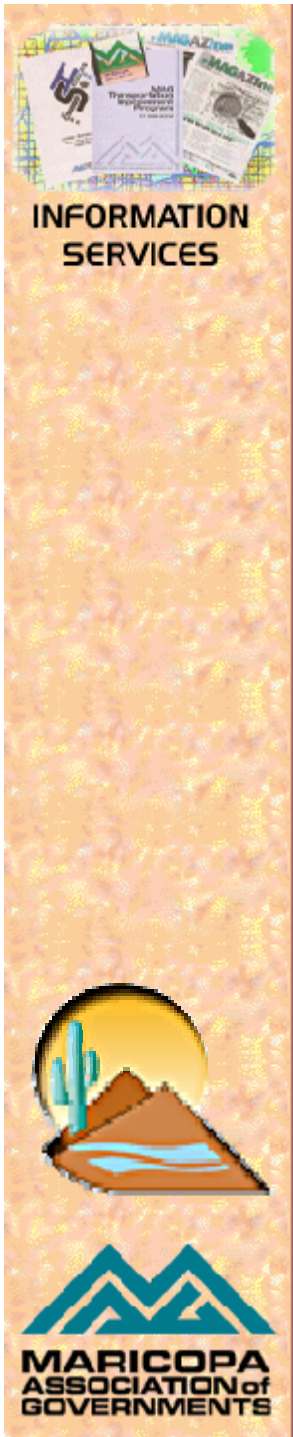
- Requires official socioeconomic estimates and projections
- DES prepares state and county estimates and projections with input from the state Councils of Governments (COGs)
- COGs may prepare subcounty estimates and projections for their respective counties

MAG Planning Activities

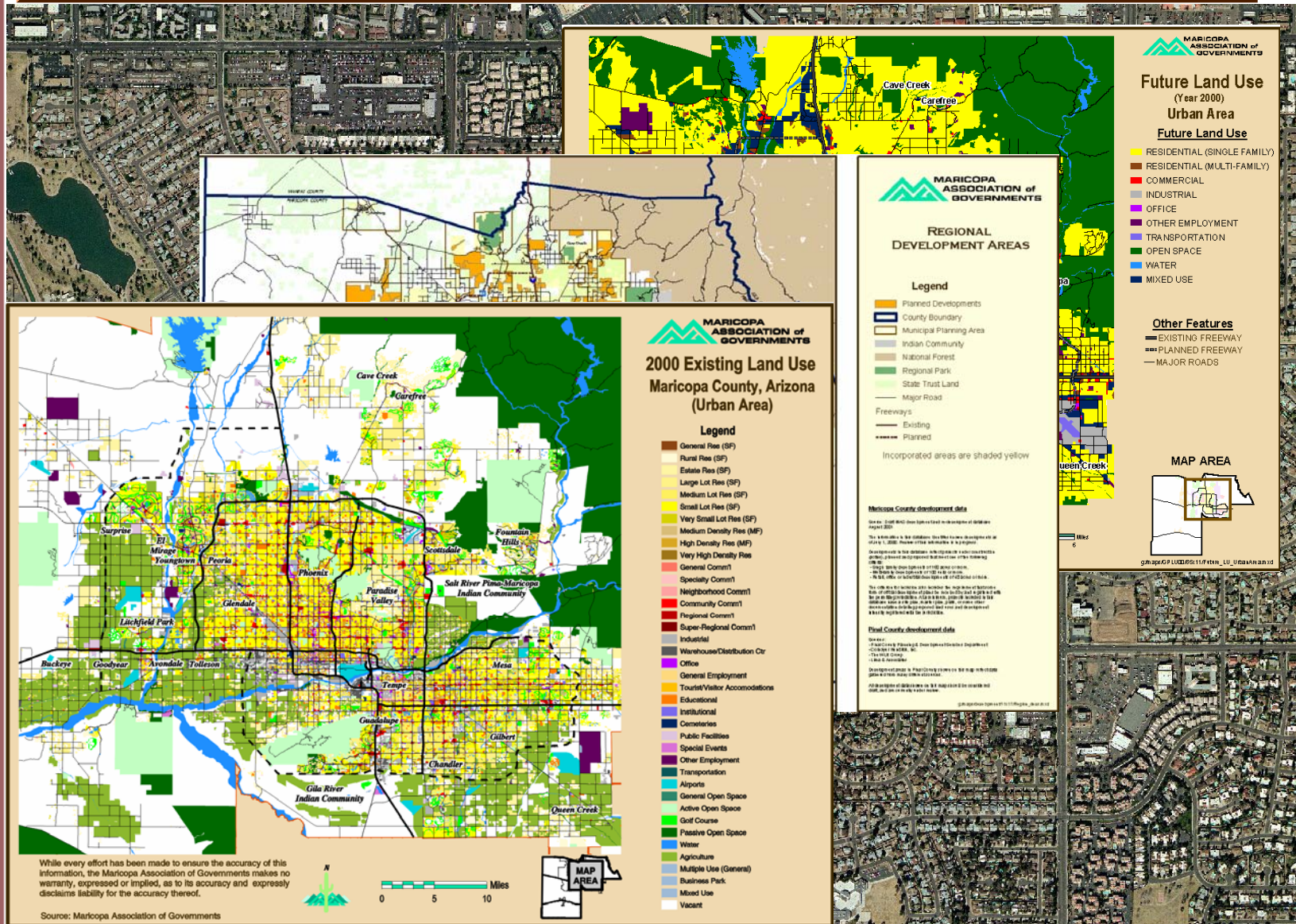


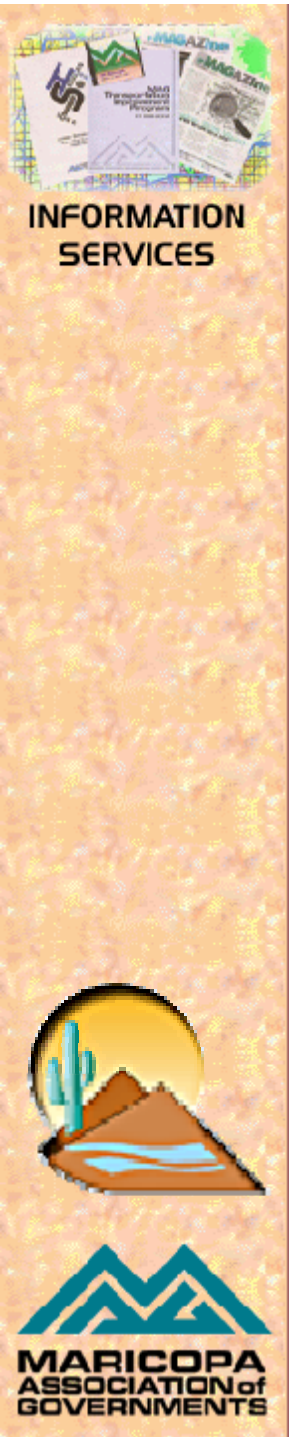


Data Collection Activities

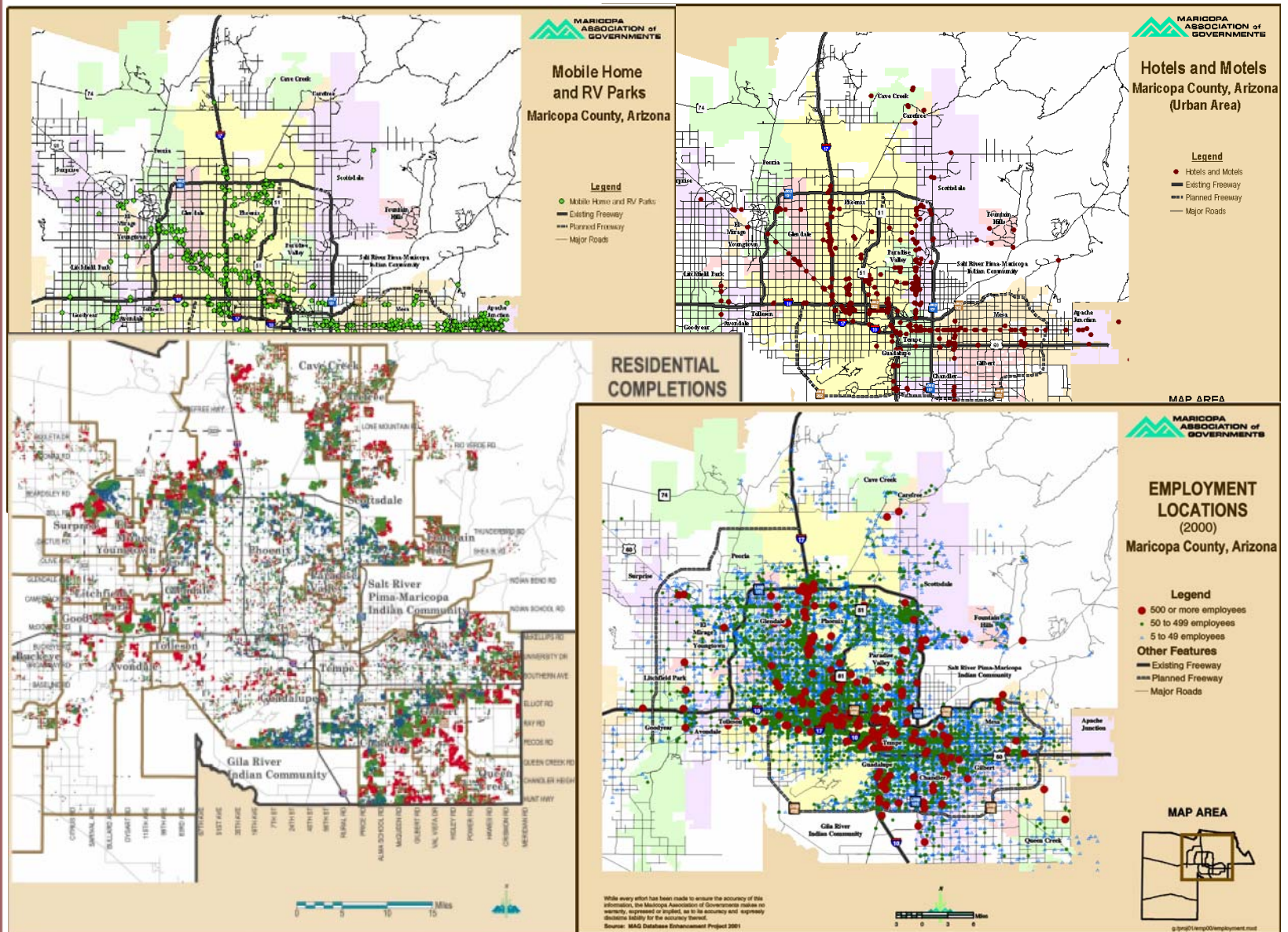


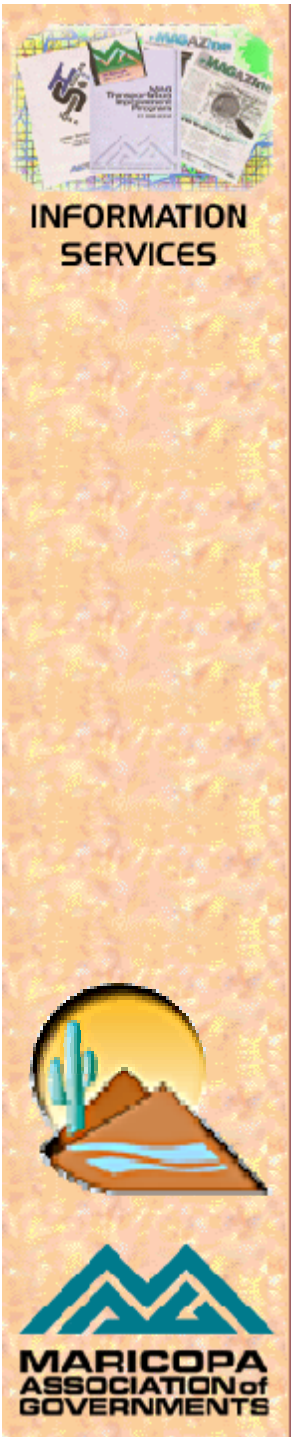
Member agencies provide or review land use information



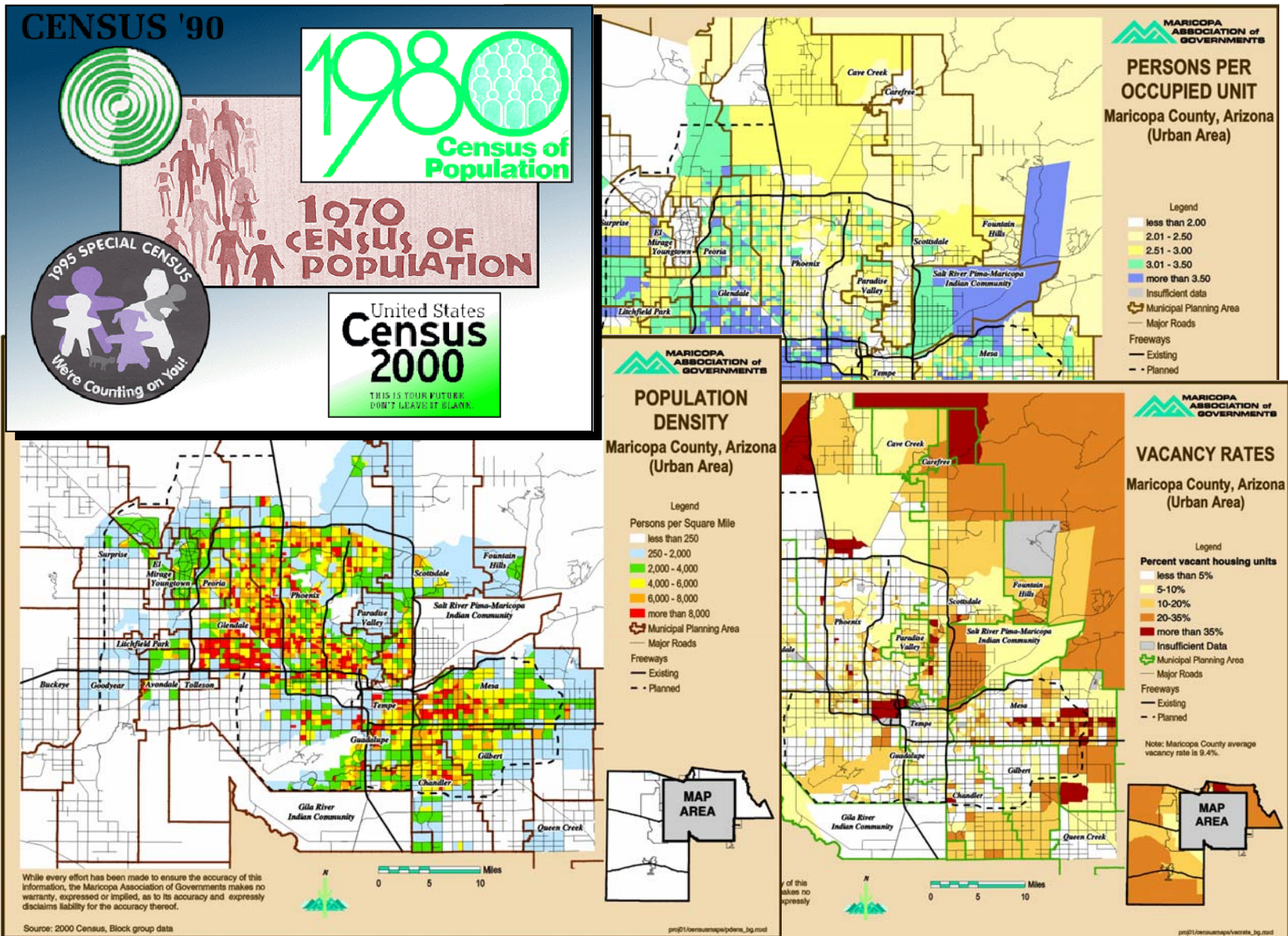


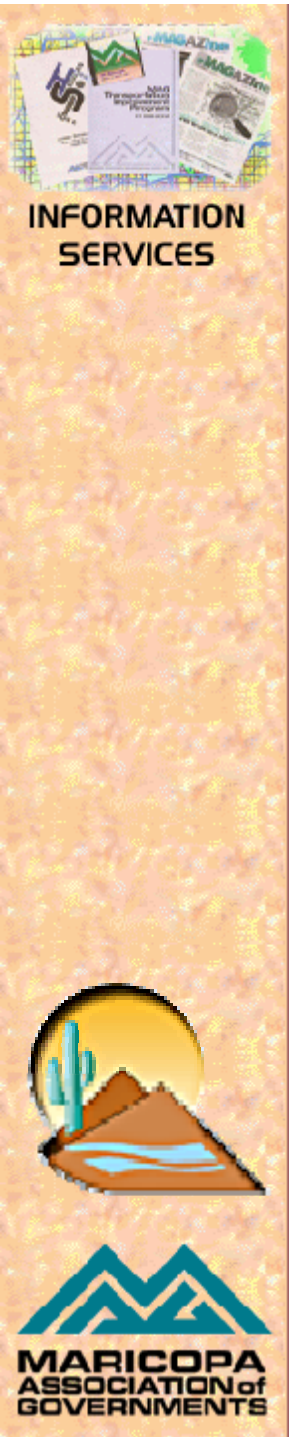
And locational information





We ensure consistency with the most recent census





We Have Population-based Surveys and Assumptions

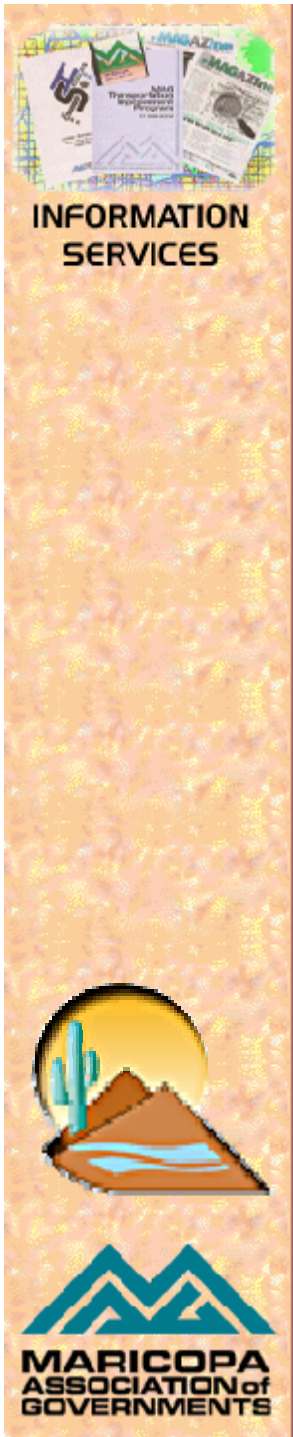
- Occupancy rates over time
- Population per household over time
- Units per acre by land use
- Seasonal population
- Transient population
- Post High School enrollment



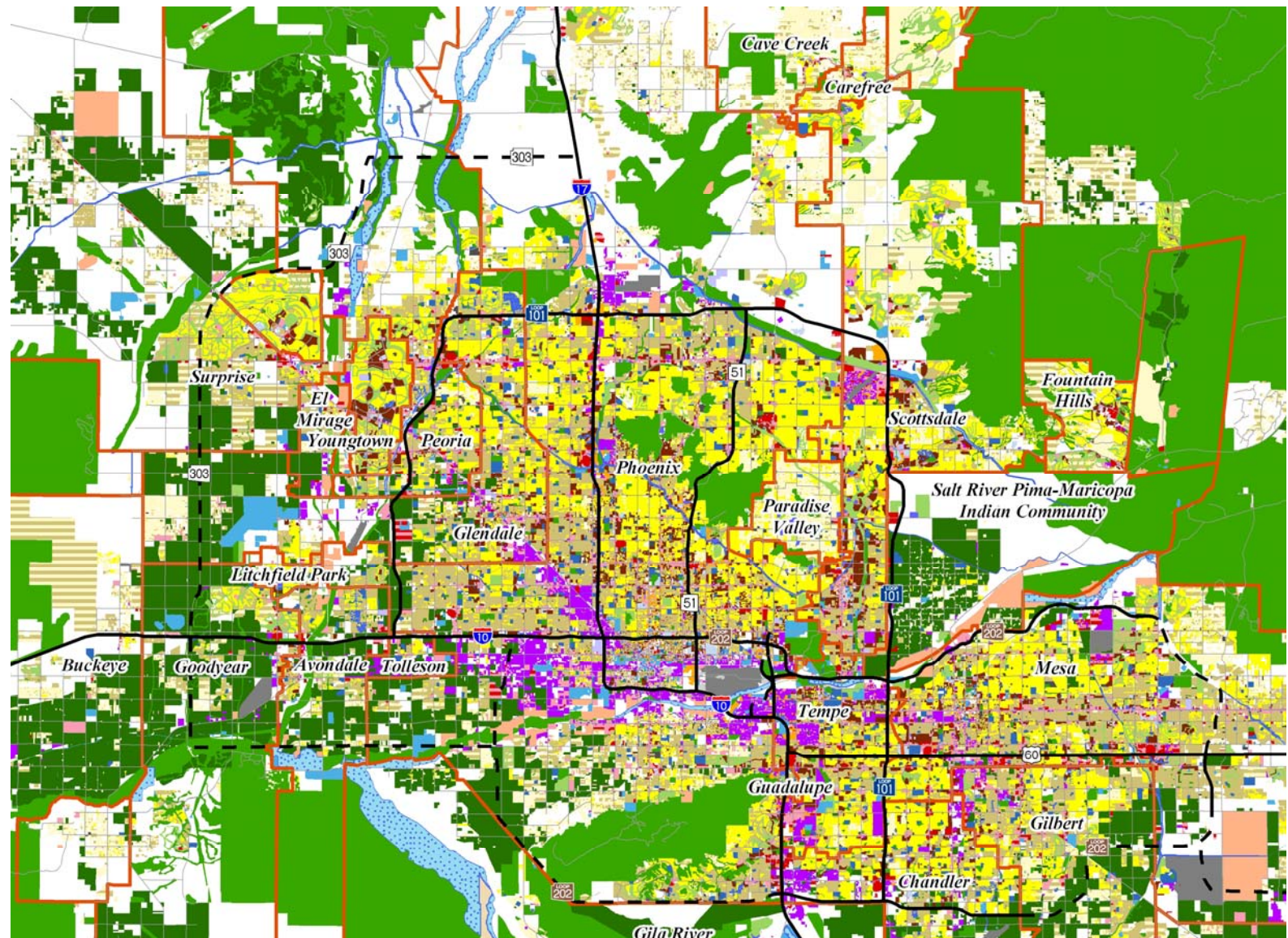
And Employment-based Surveys and Assumptions

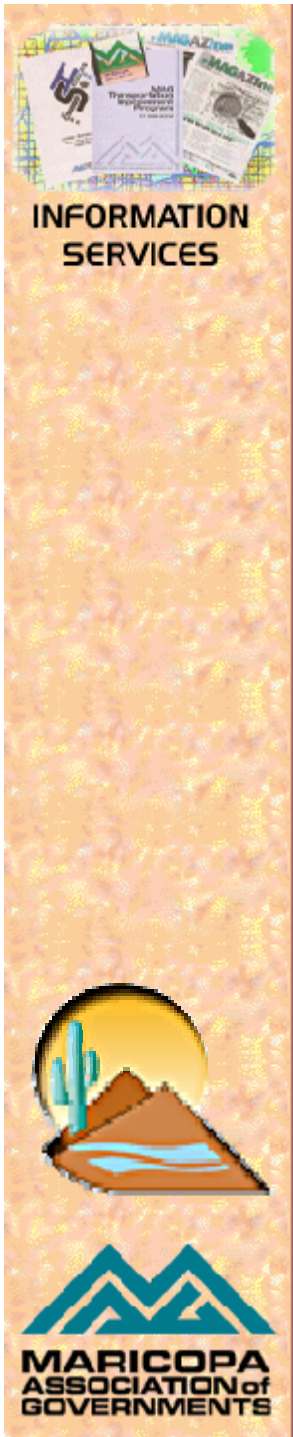
- Employment/Population ratios
- Employment control totals by sector
- Floor area ratios by land use
- Employment per 1000 square feet by employment category/land use
- Work at home employment
- Construction employment
- Non basic employment



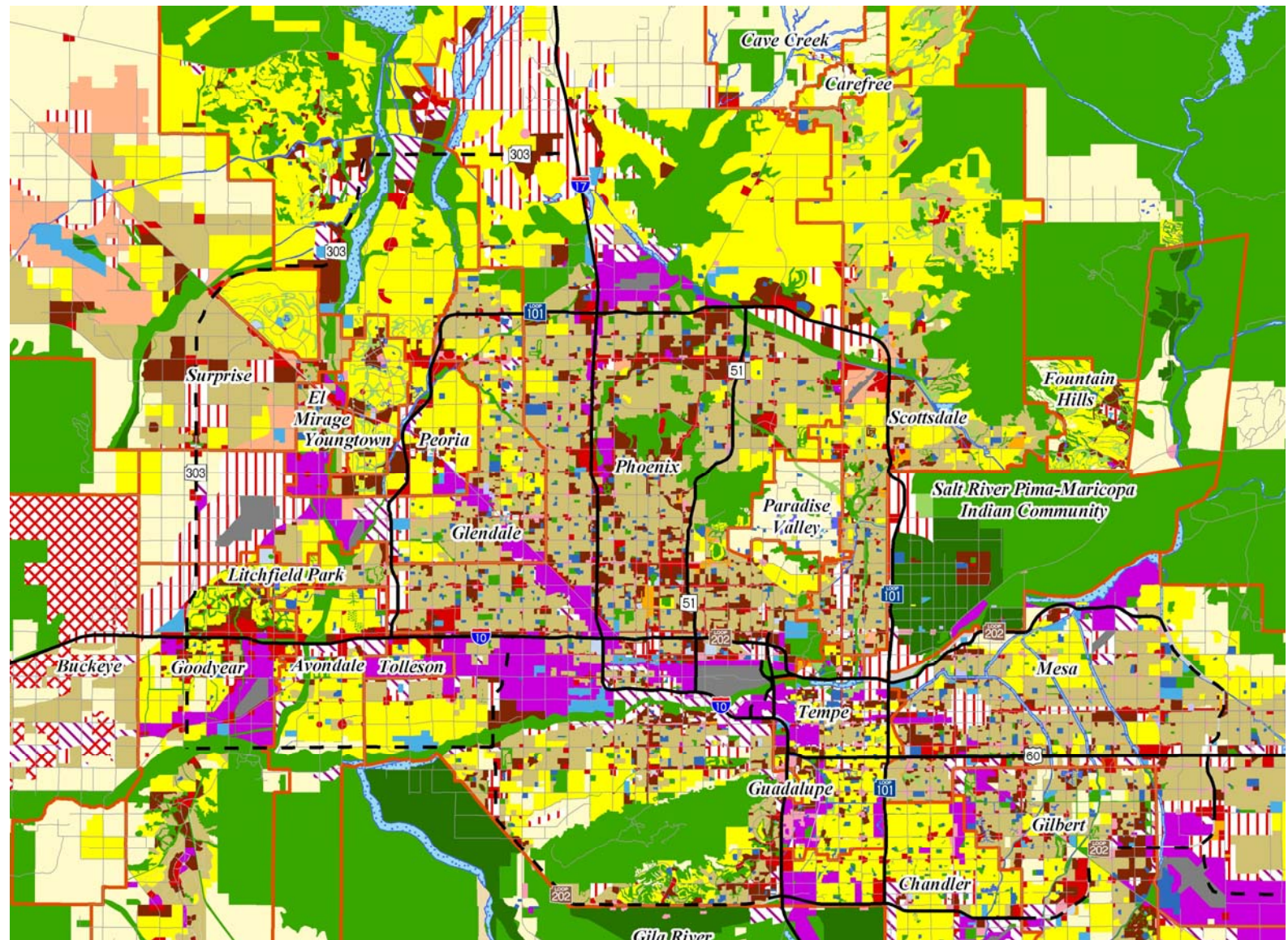


Existing Land Use Determines Available Land





General Plans are an Indication of the Future



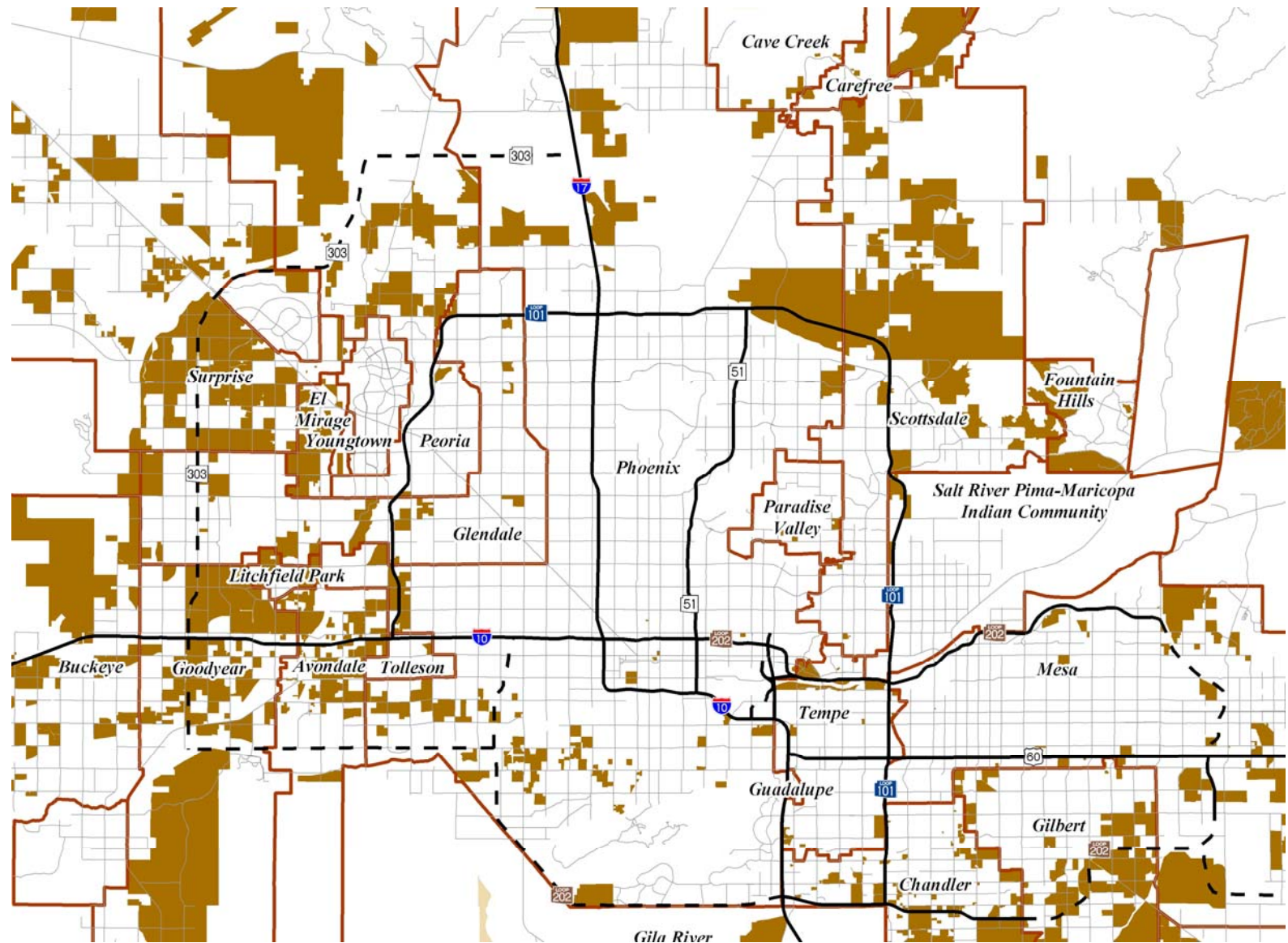


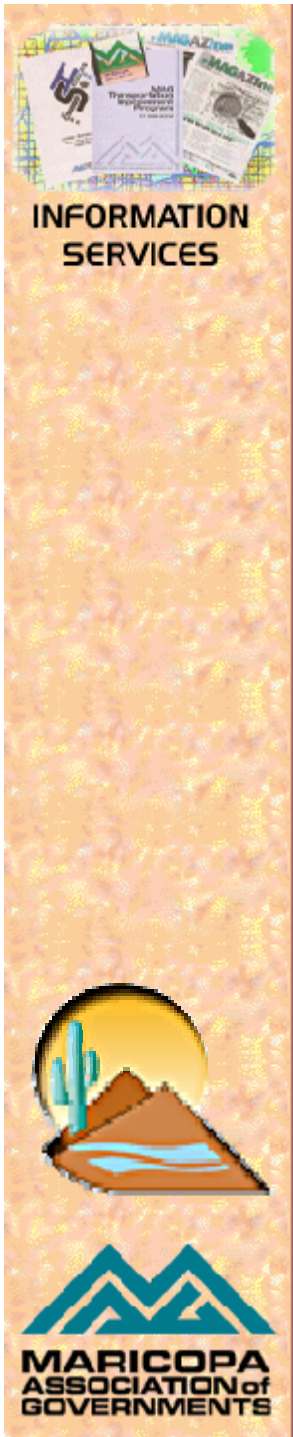
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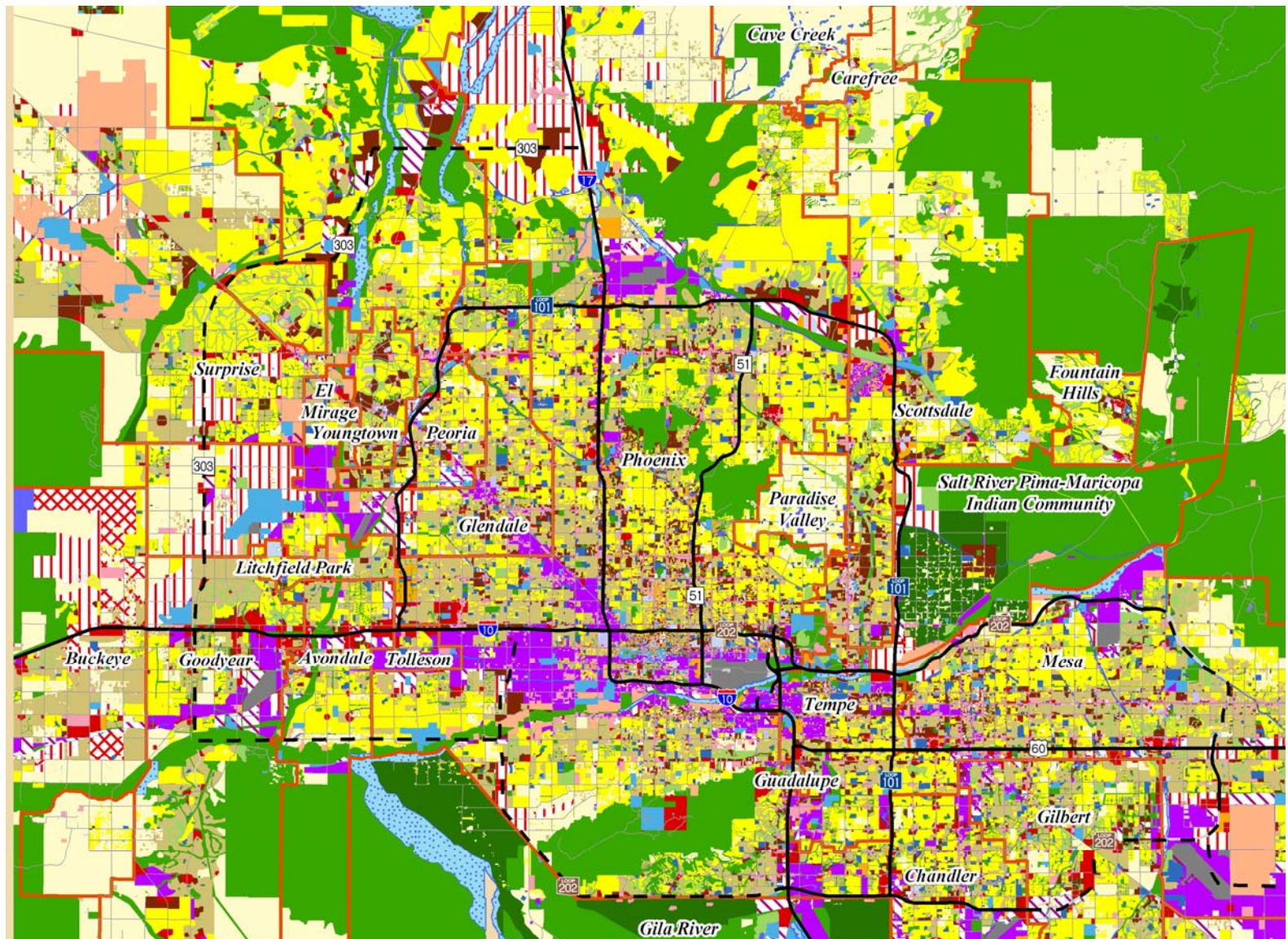
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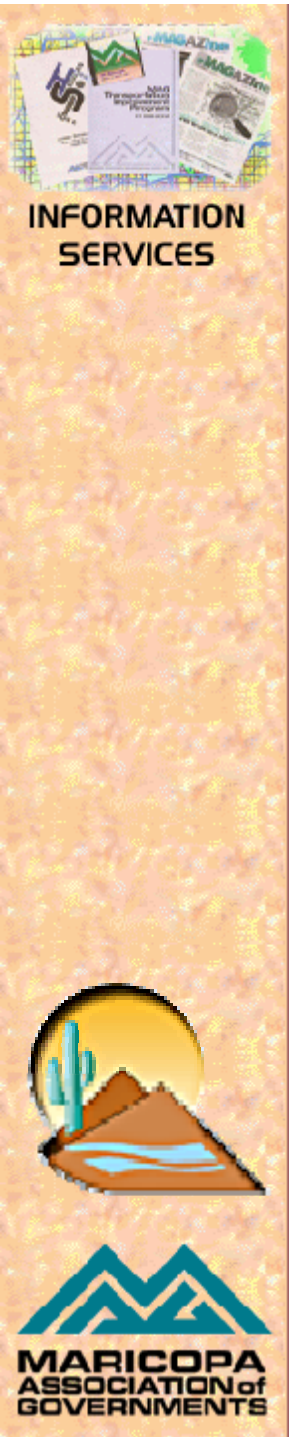
Developments Identify Near Term Growth





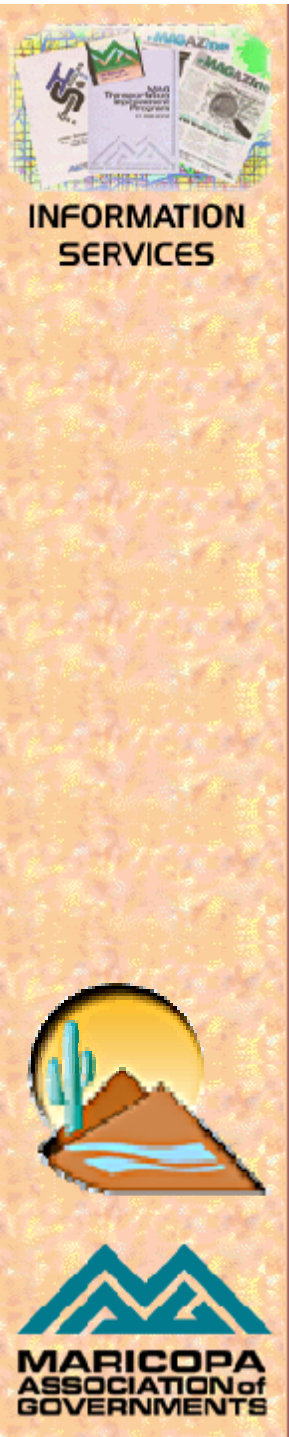
All Combined are the Vision of the Future



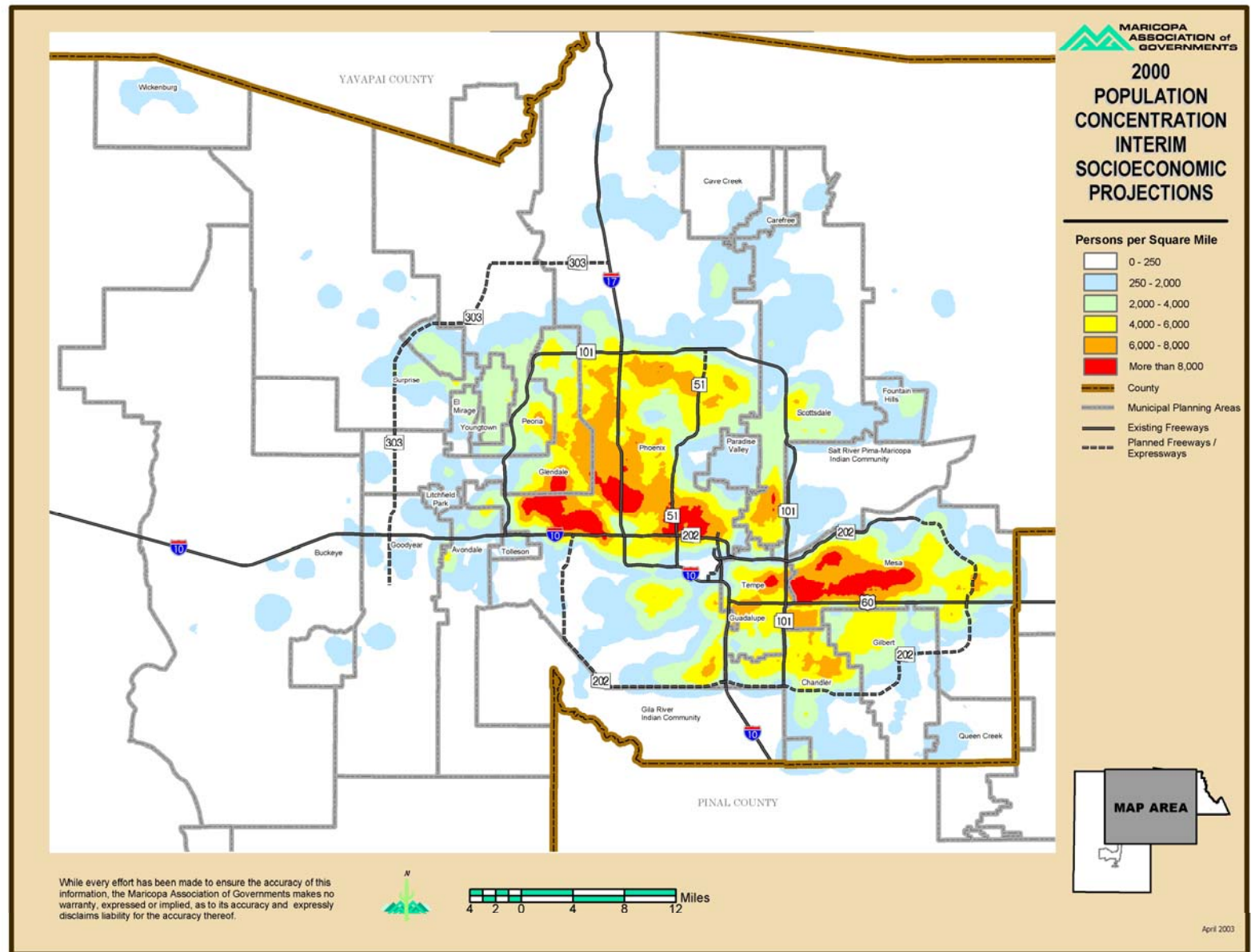


MAG Member Agency Involvement

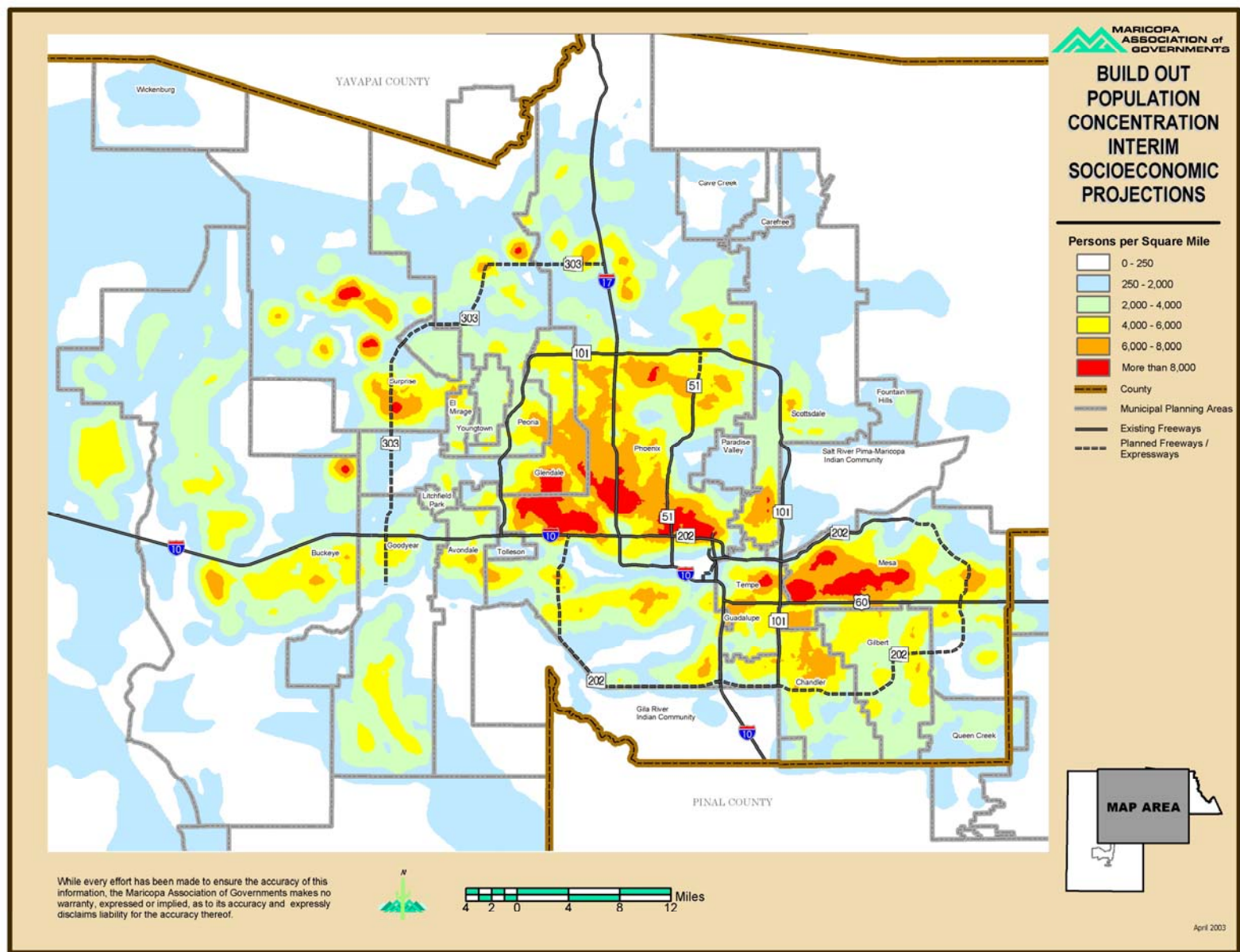
- **Review of all data and GIS coverages on an ongoing basis**
- **Review of Census data**
- **Review of all surveys**
- **Agency input on target densities, mixed use categories, persons per household and occupancy rates over time, etc.**
- **POPTAC approval of all assumptions and their related methodologies**



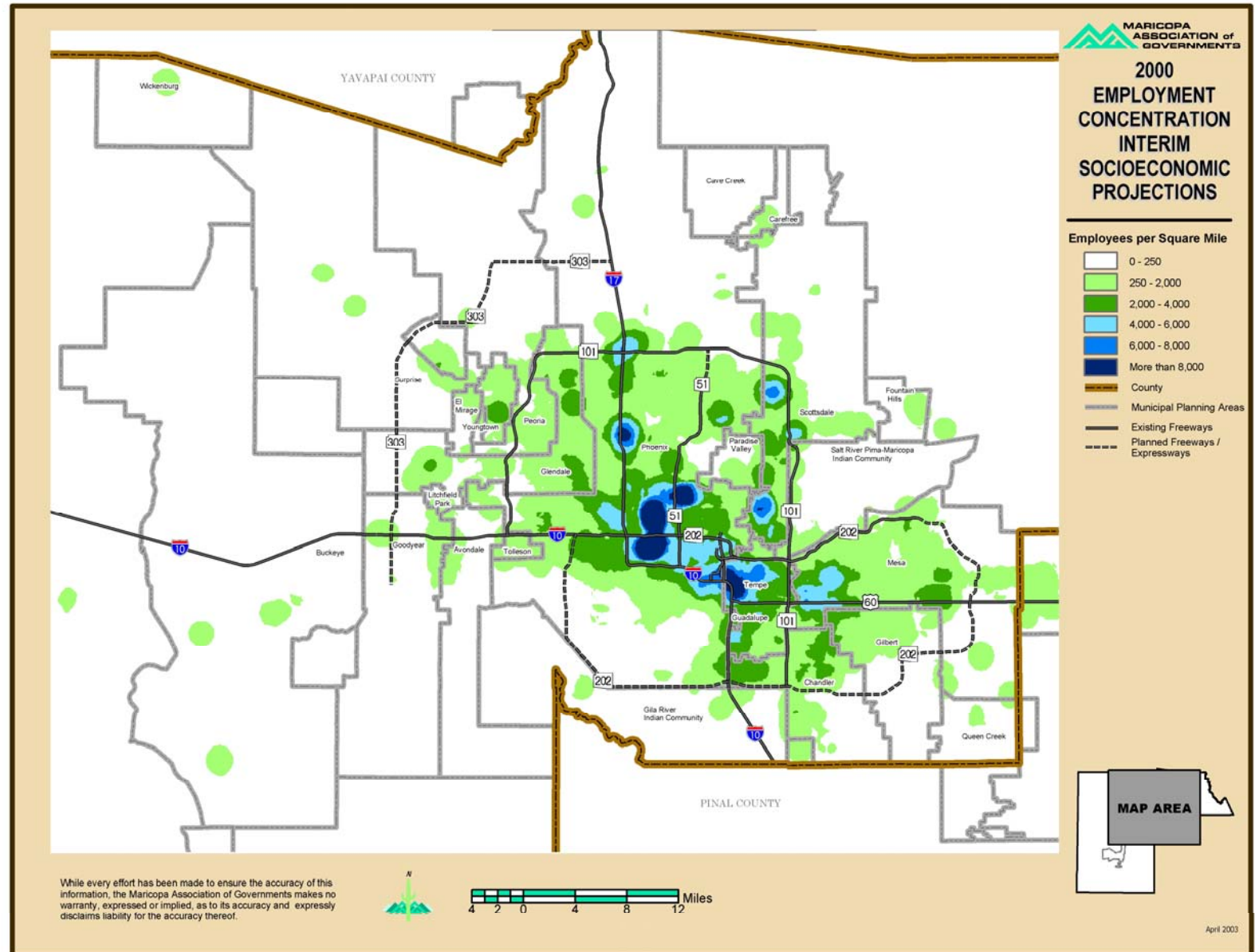
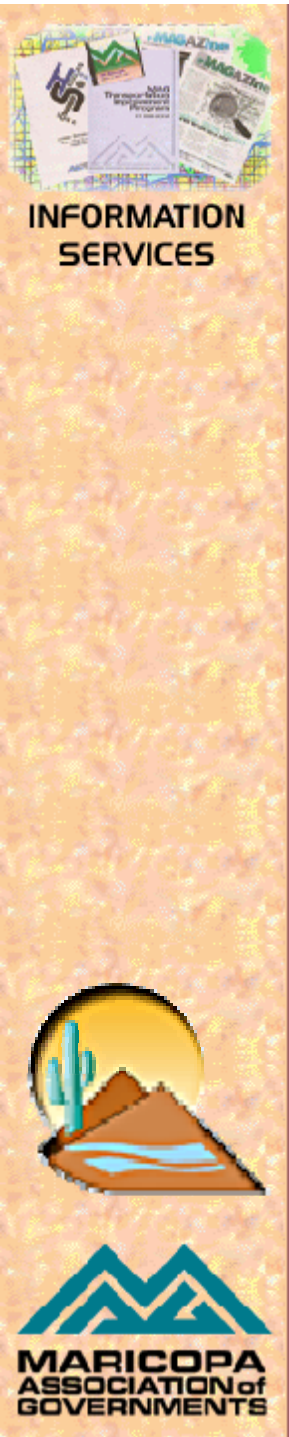
Population Base



Population Capacity



Employment Base



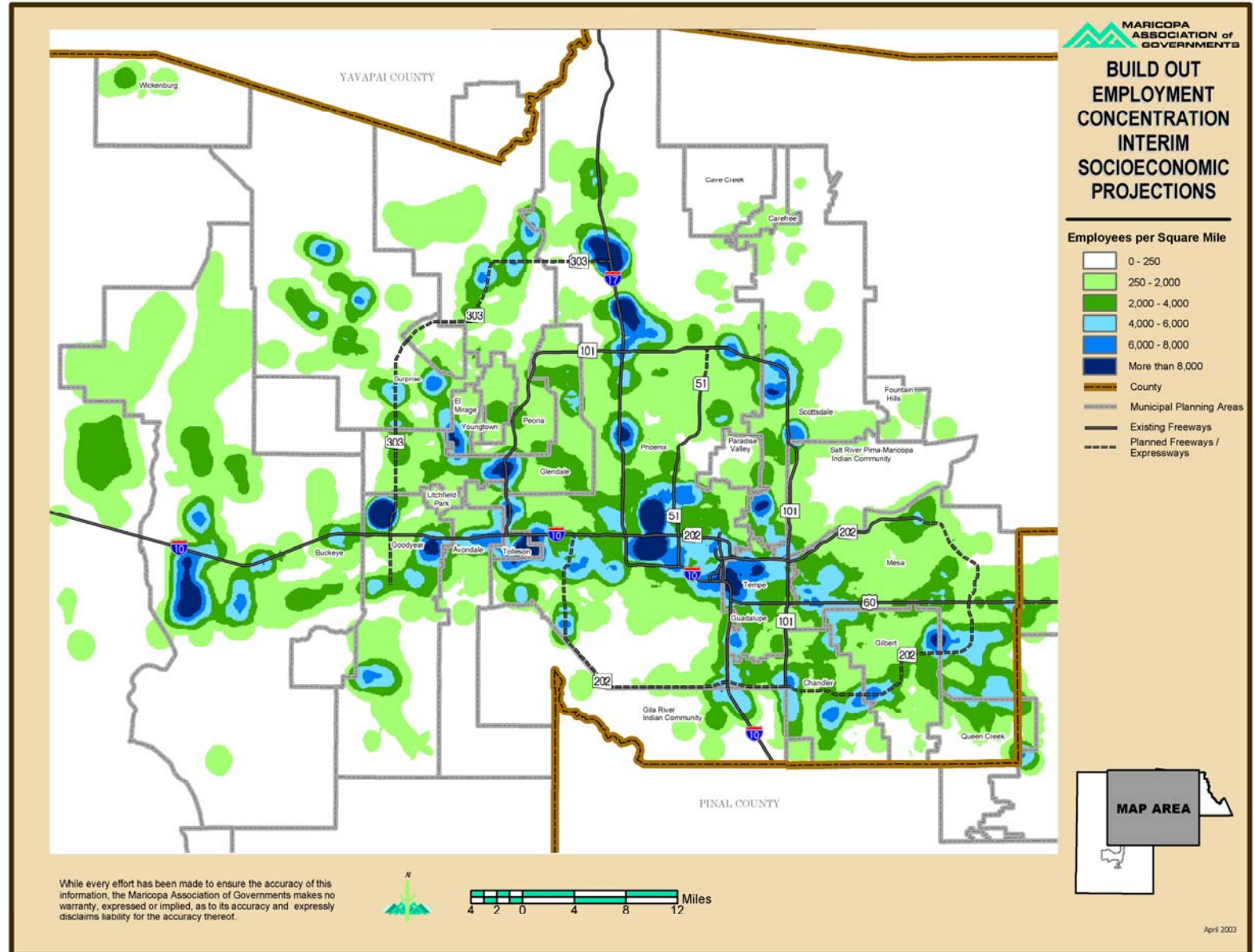
Employment Capacity



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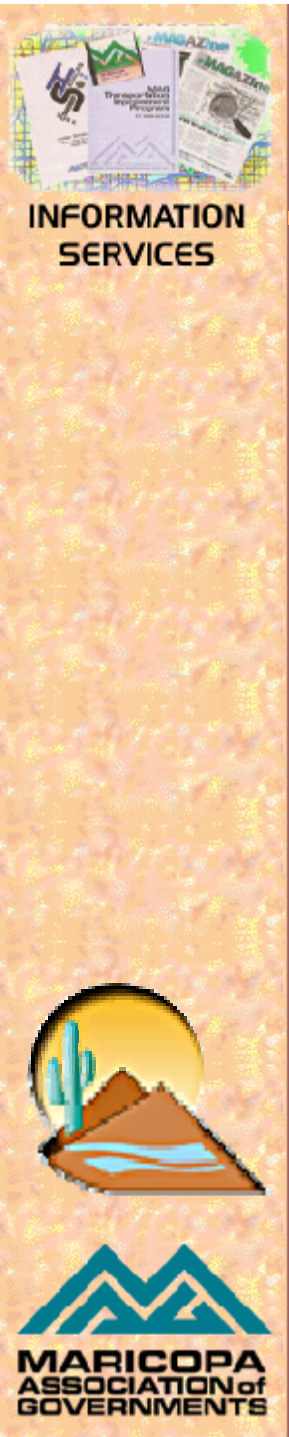


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Current Socioeconomic Projections Modeling

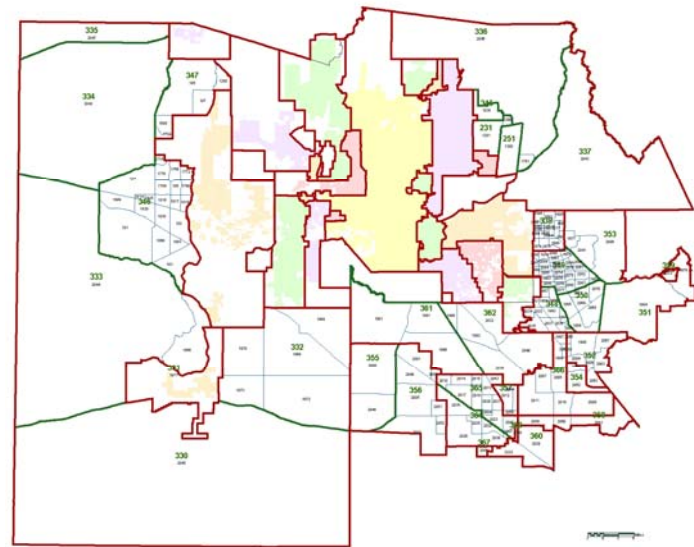


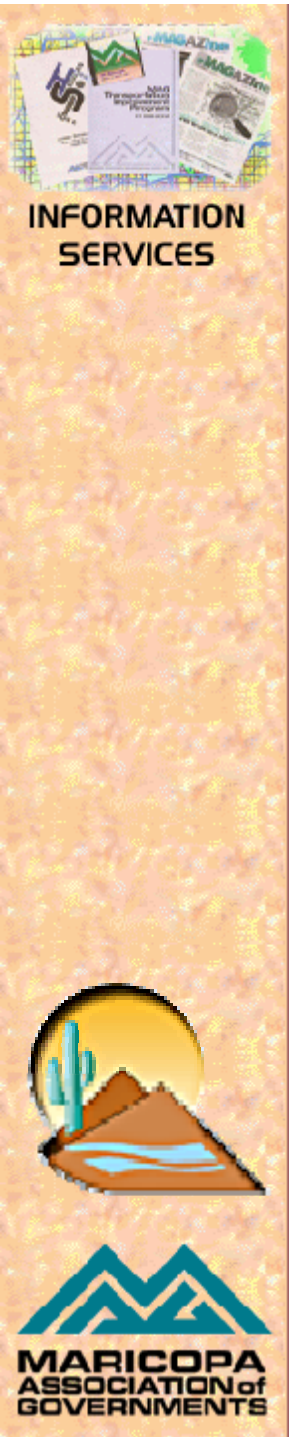
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MAG Geography (2003)

- In Maricopa County MPAs:
 - Municipal Planning Area (MPA) 27
 - Regional Analysis Zone (RAZ) 147
 - Traffic Analysis Zone (TAZ) 1868
- In Pinal County MPAs:
 - MPAs 7
 - RAZs 22
 - TAZs 133





Current three-tier modeling process

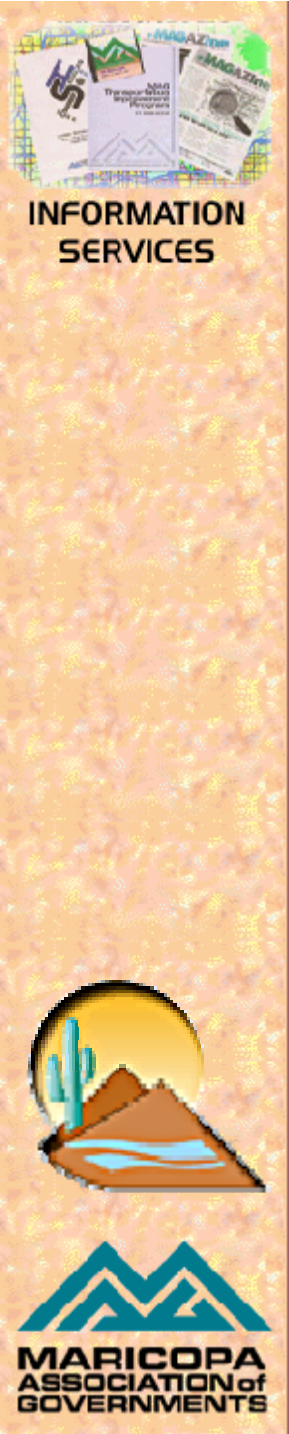
Maricopa County Control Totals
DES Demographic Model
ASU/UofA/DOC State Economic Strategy
REMI Economic Model



Sub-Regional Model
DRAM/EMPAL
Spatial Distribution Model



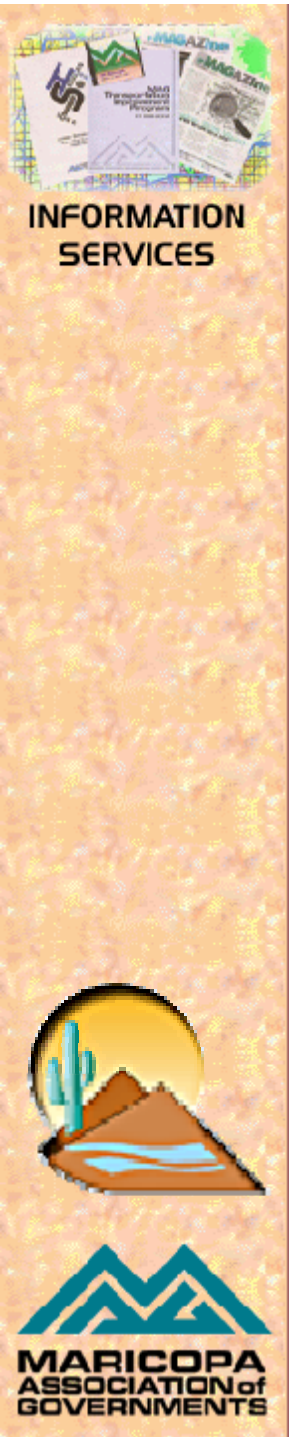
Small Area Model
SAM-IM
Small Area Allocation



County Level Models

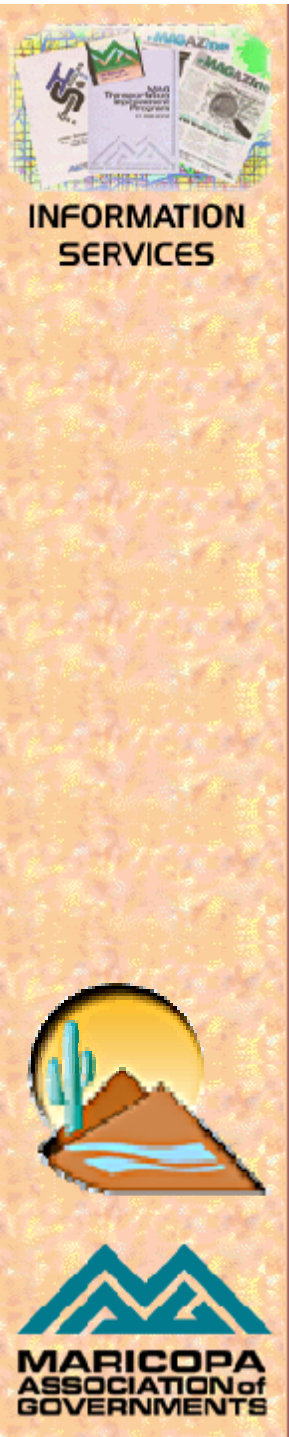
- **Population**
 - **Births**
 - **Deaths**
 - **Net Migration**

- **Employment**
 - **By Industry**
 - **By Sector**
 - **office**
 - **retail**
 - **industrial**
 - **public**
 - **other**



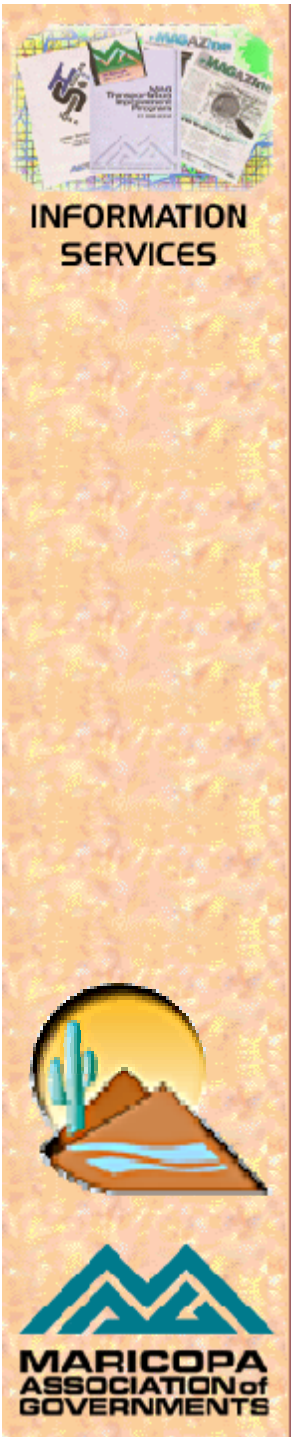
Subcounty Regional Analysis Zone Model

- **Spatial Allocation Model**
- **Projections in five year intervals**
- **Uses such factors as**
 - **Available land**
 - **Current population and employment**
 - **Accessibility**
- **County projections used as control totals for**
 - **Employment by Sector**
 - **Households**



Subarea Allocation Model – Information Manager (SAM-IM)

- **Totally within GIS**
- **County or sub-county control totals are used**
- **Each land use dealt with separately and in any order**
- **Different factors influence growth of each land use**
- **Grid based -- currently 1 acre**



SAM-IM Special Features

- **Development velocity curves determine timing of construction in active developments**
- **Automatic policy overrides to set minimum and maximum growth in each zone**
- **Scenario capability without rerunning entire model**
- **Feedback loops with subcounty model and with transportation model**

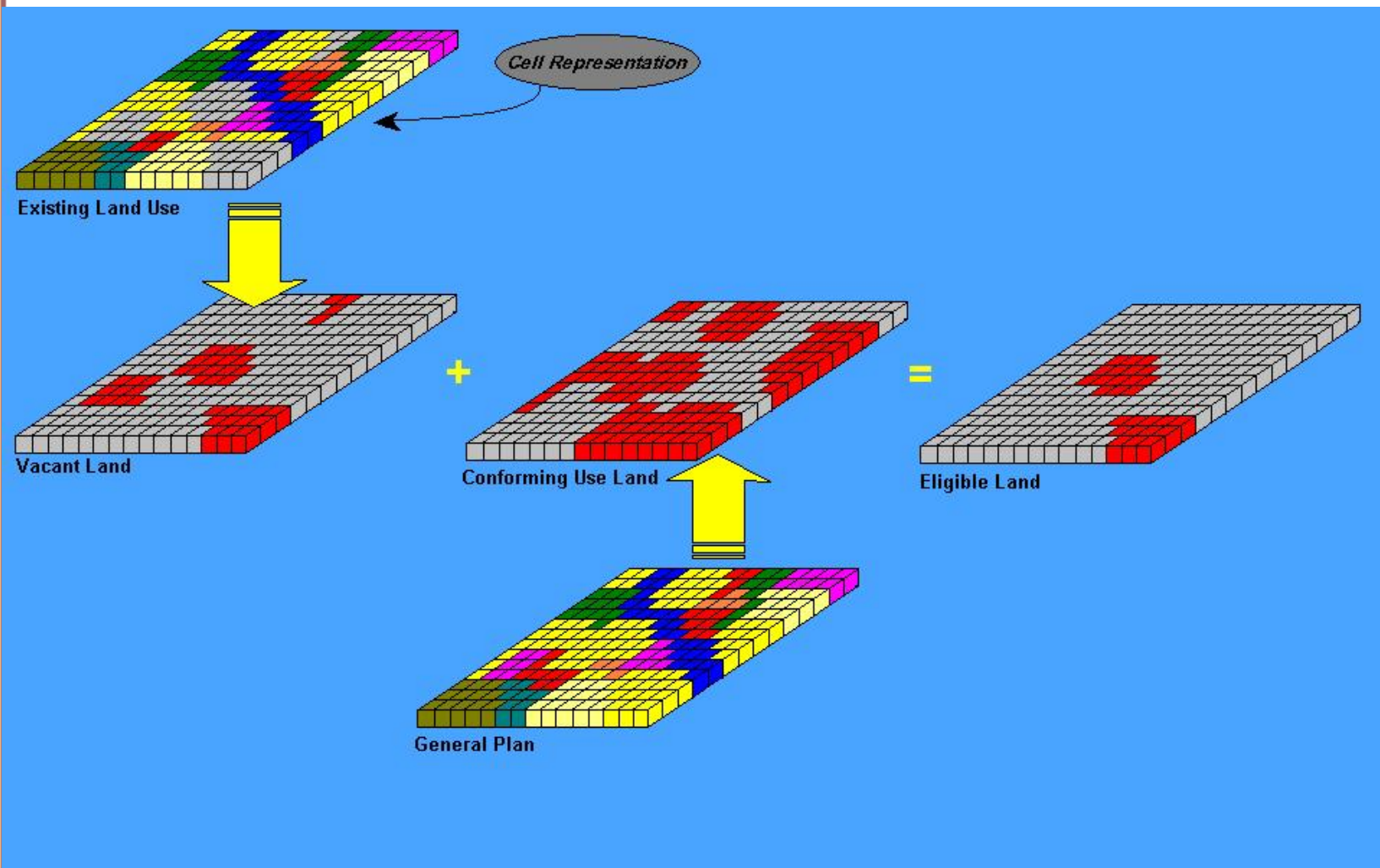


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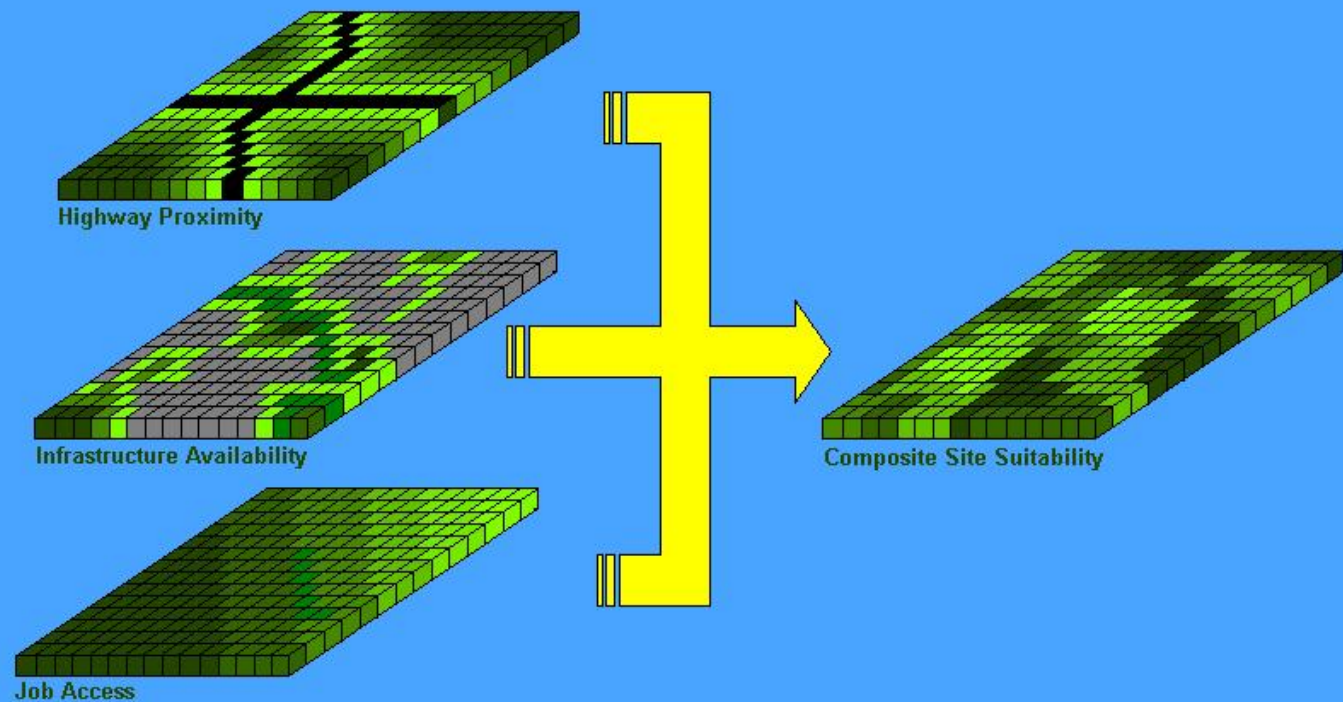
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Determine Eligibility to Absorb Growth (by Land Use)



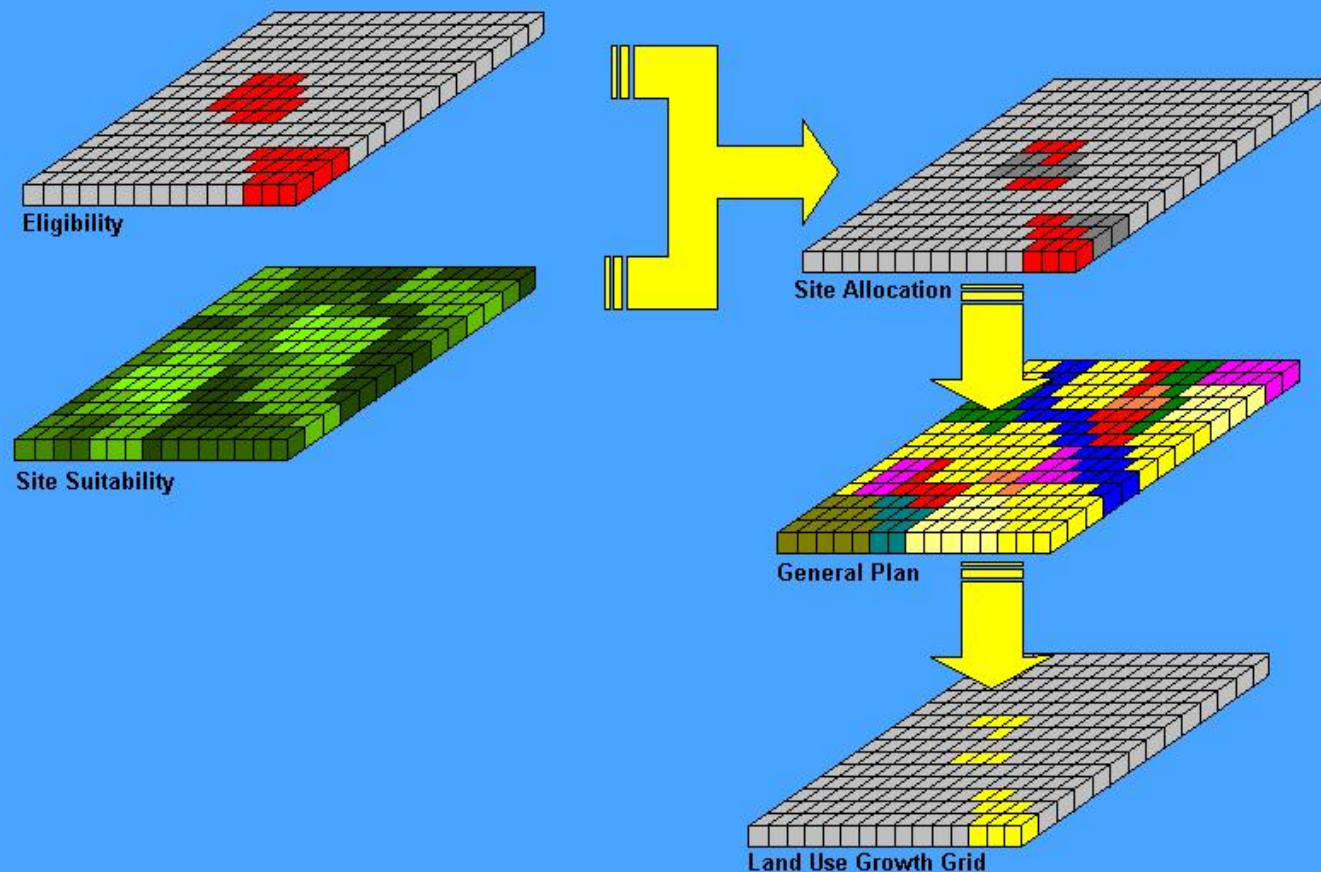


Identify Growth Factors and Perform Suitability Evaluation



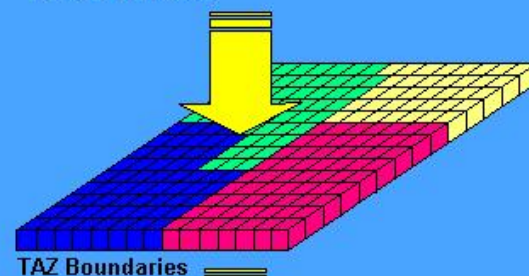
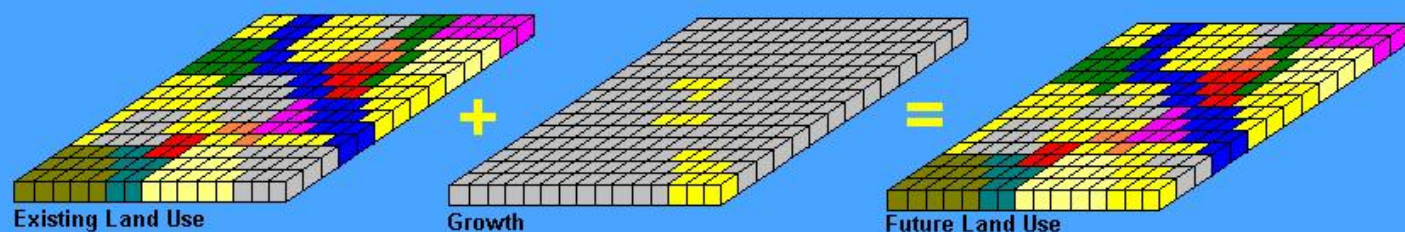


Prioritize Allocation of Sites to Eligible Lands and Limit by Control Totals





Create Land Use Map for Time Period and Sum to any Geography



Attributes Of Gtaz

TAZ	Year	Mps	District	Reshh	Gghh	Tranhh	Seashh	Otheng	Fuber
487	2000	PH	216	1	0	0	0	0	
500	2000	PH	218	0	0	0	0	0	
503	2000	PH	218	843	0	0	0	0	
506	2000	PH	218	991	0	0	0	0	
507	2000	PH	218	0	0	0	0	0	
508	2000	PH	218	0	0	0	0	0	
510	2000	PH	218	0	0	0	0	0	

TAZ Table



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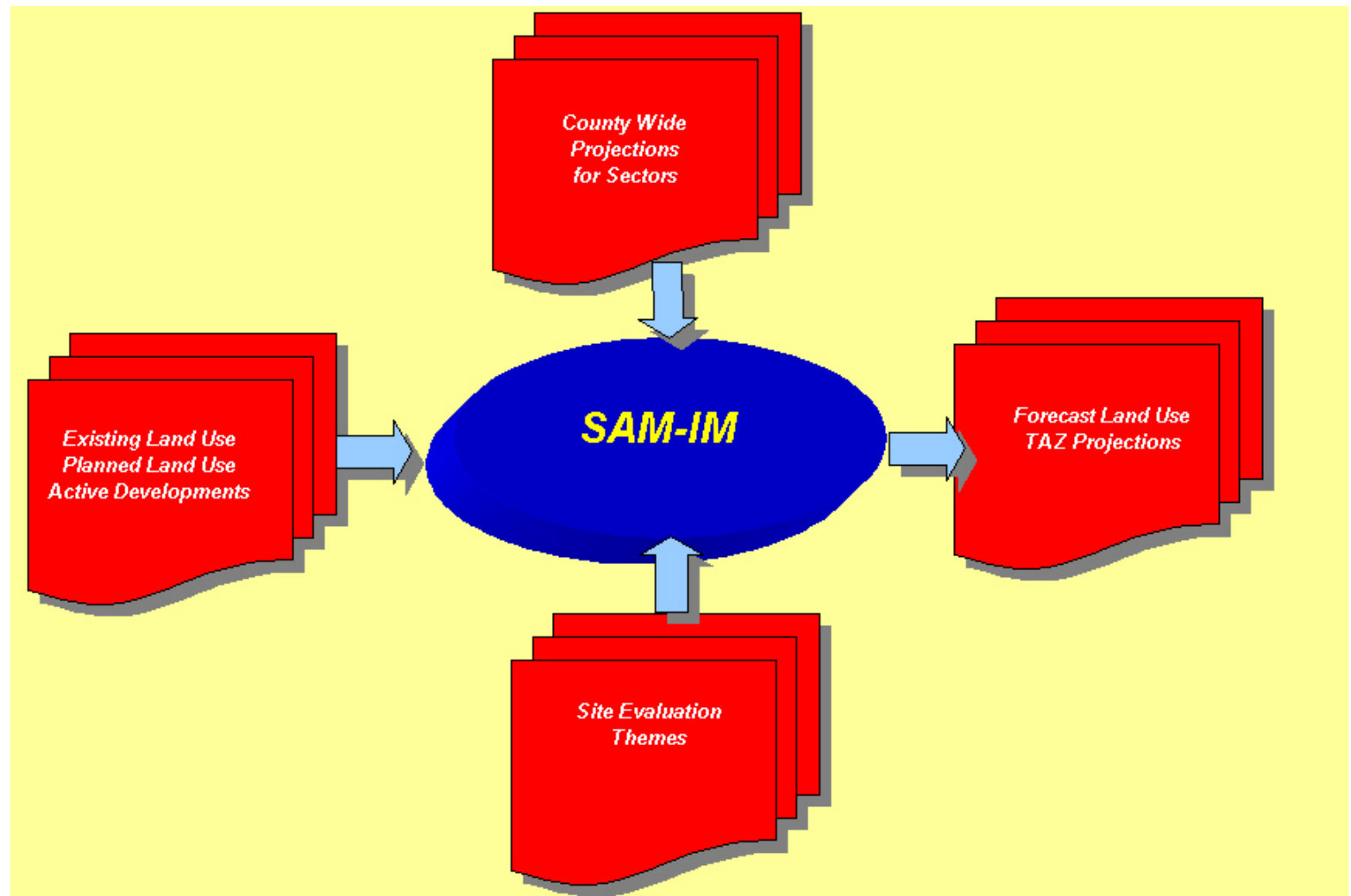


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SAM-IM Modules



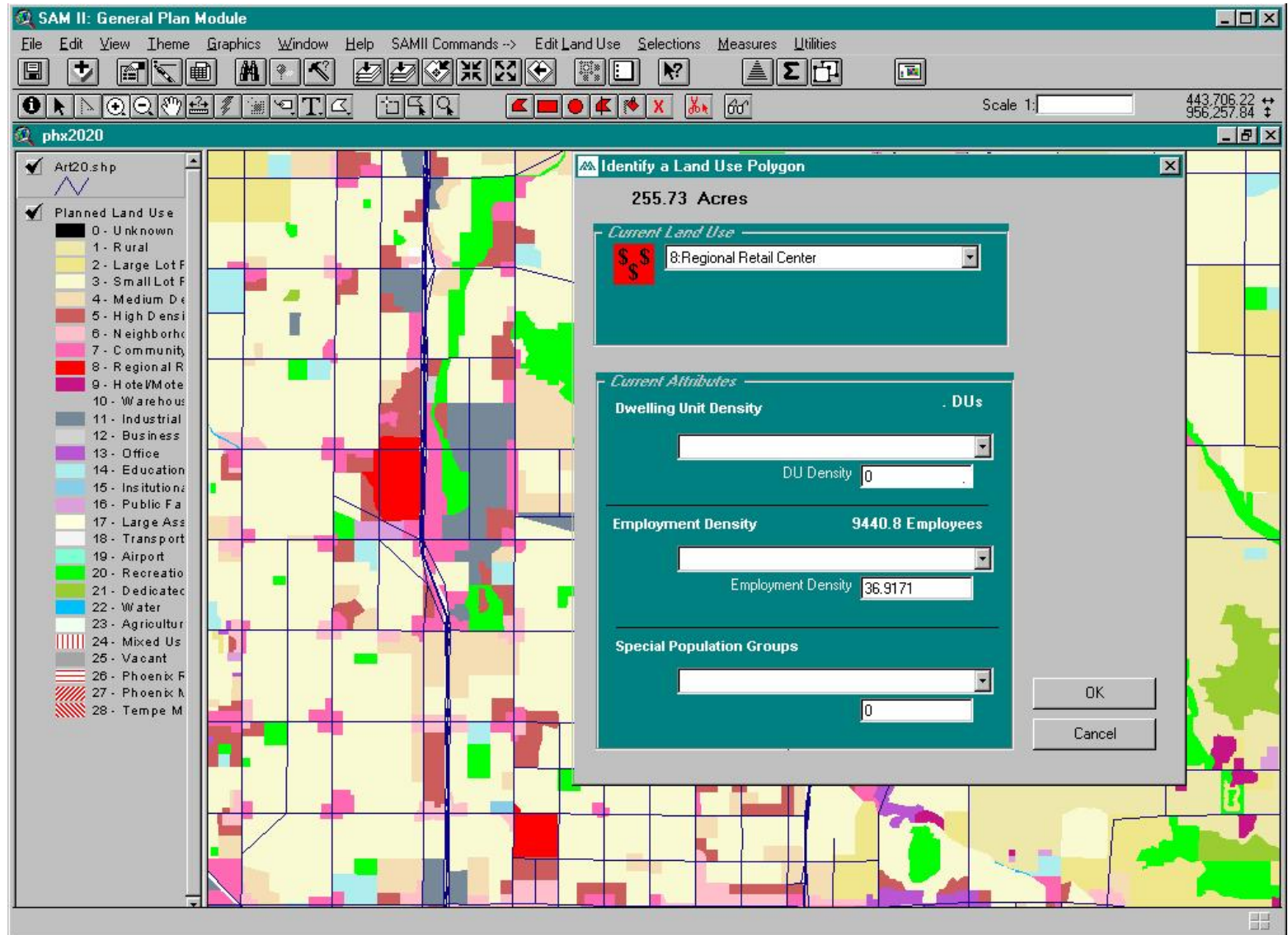


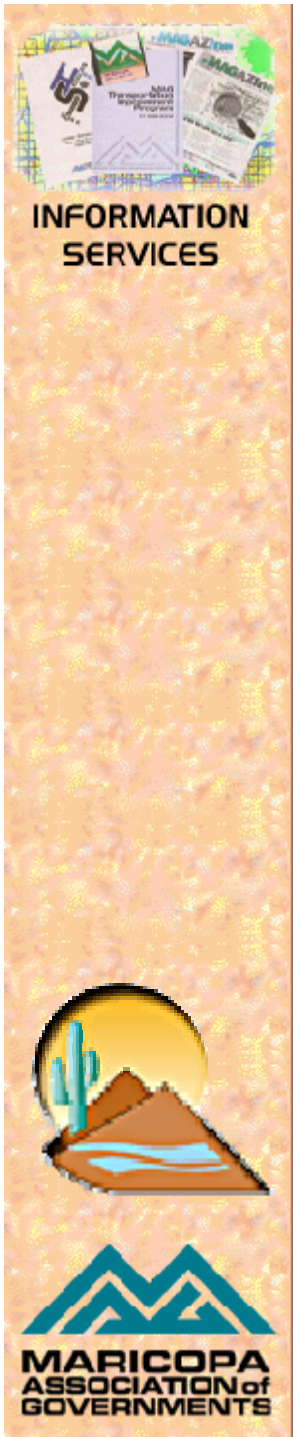
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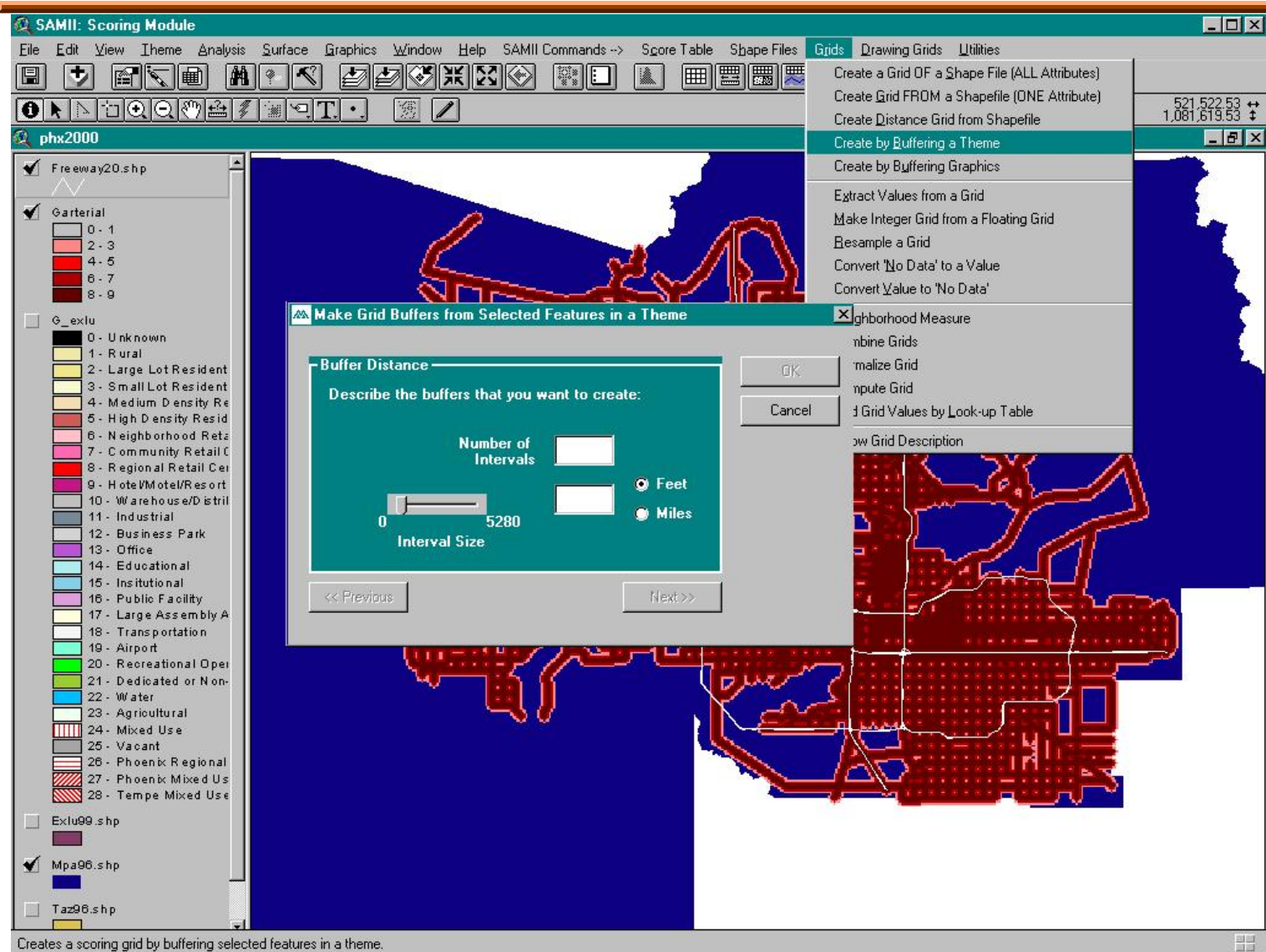
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Land Use Editors

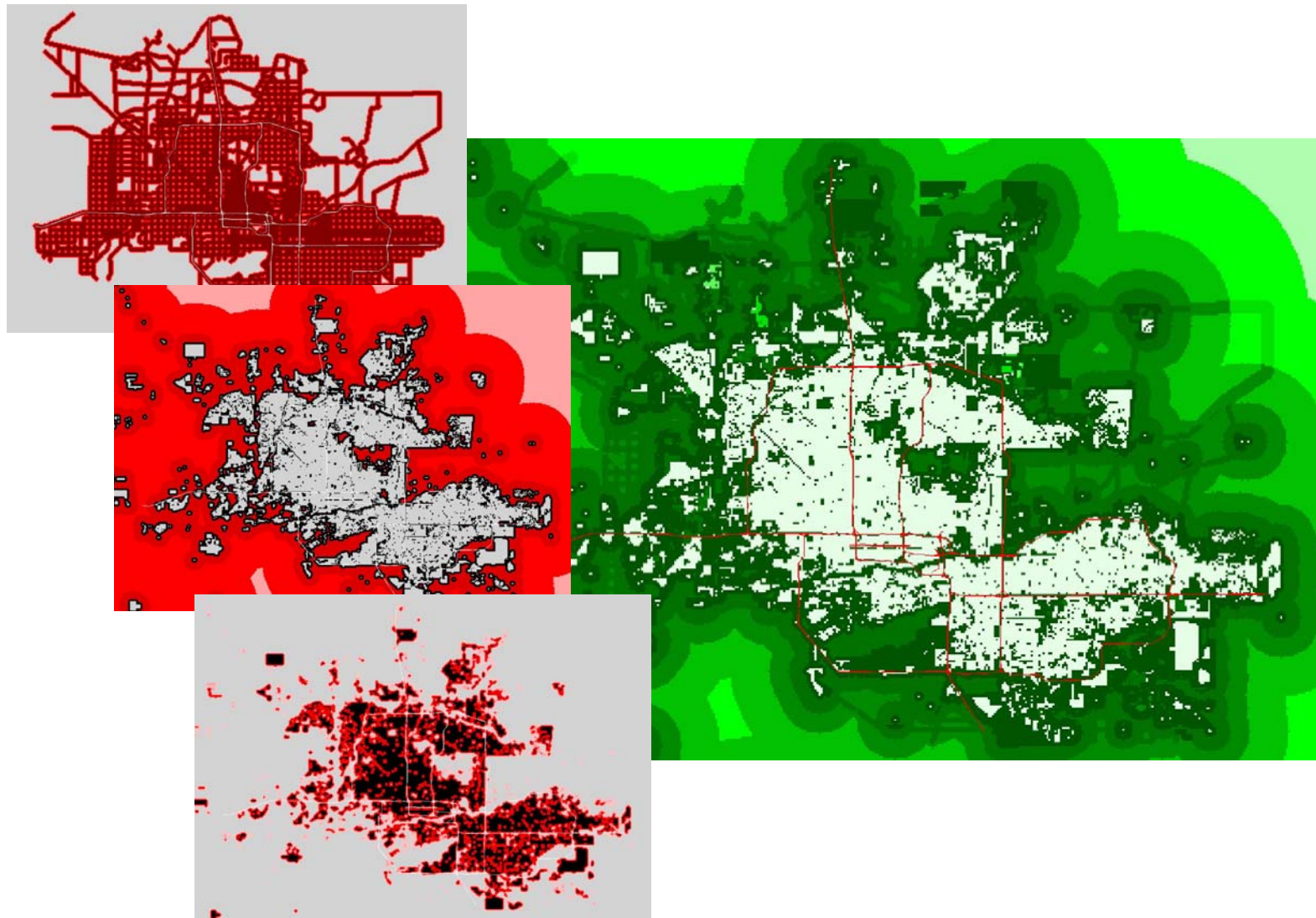


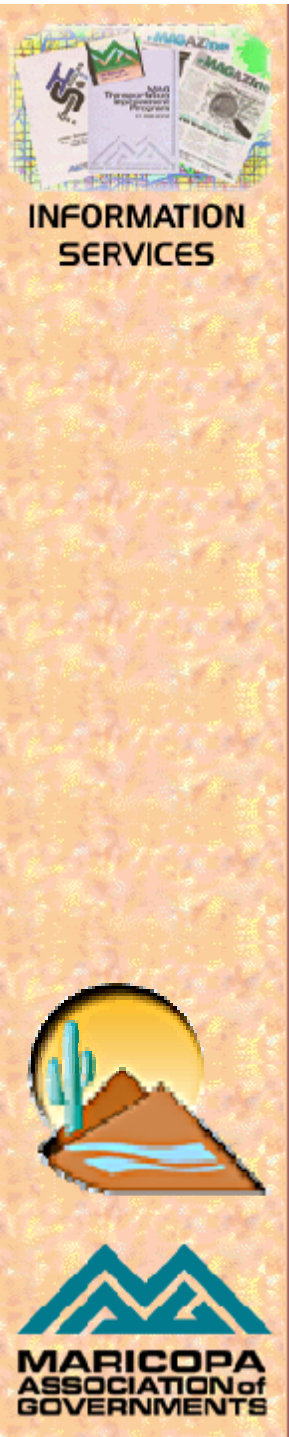


Site Evaluation Module



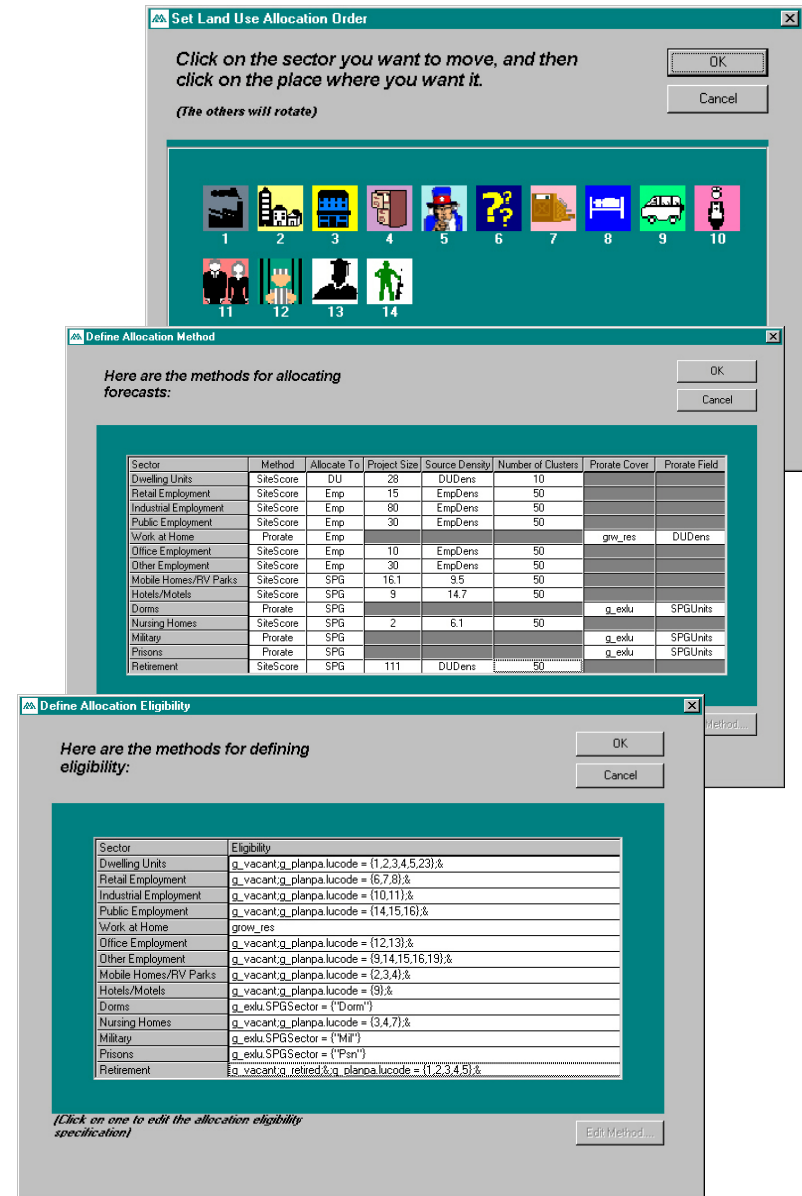
Site Suitability Evaluation



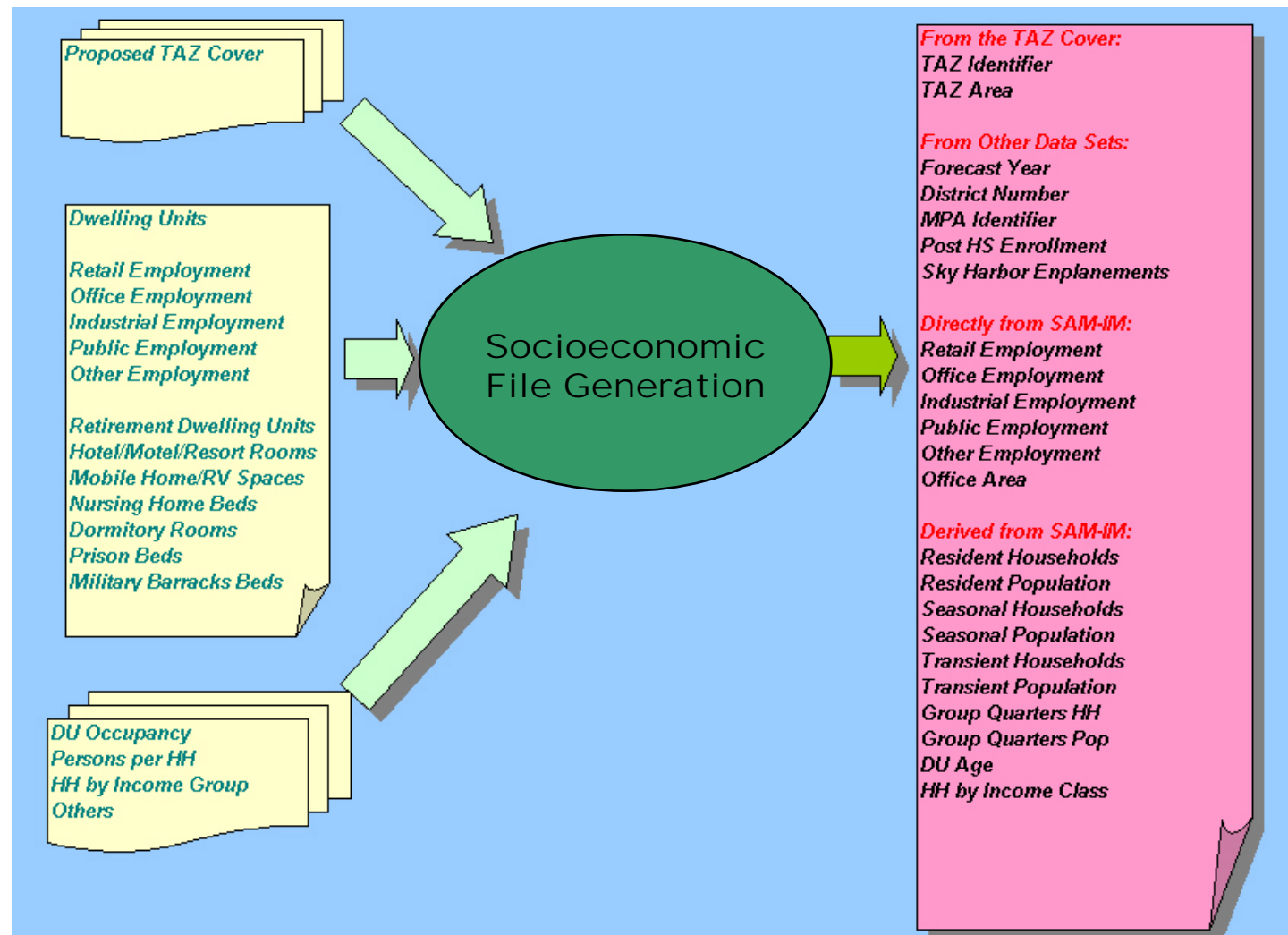


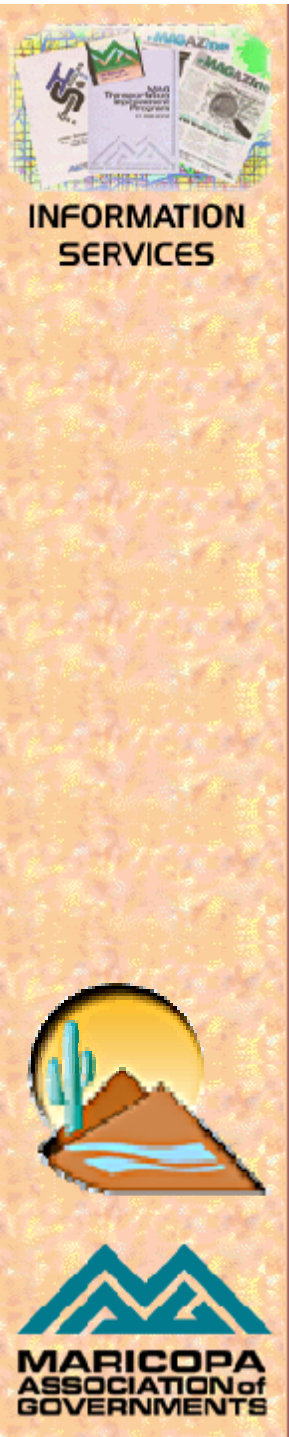
Allocation Module

- **Generates the Projection**
- **User Controls**
 - Cell resolution
 - Allocation order
 - Eligibility definition
 - Allocation methodology
 - Site selection
 - Prorate



Socioeconomic File Generation - For any Geography, any Output Format

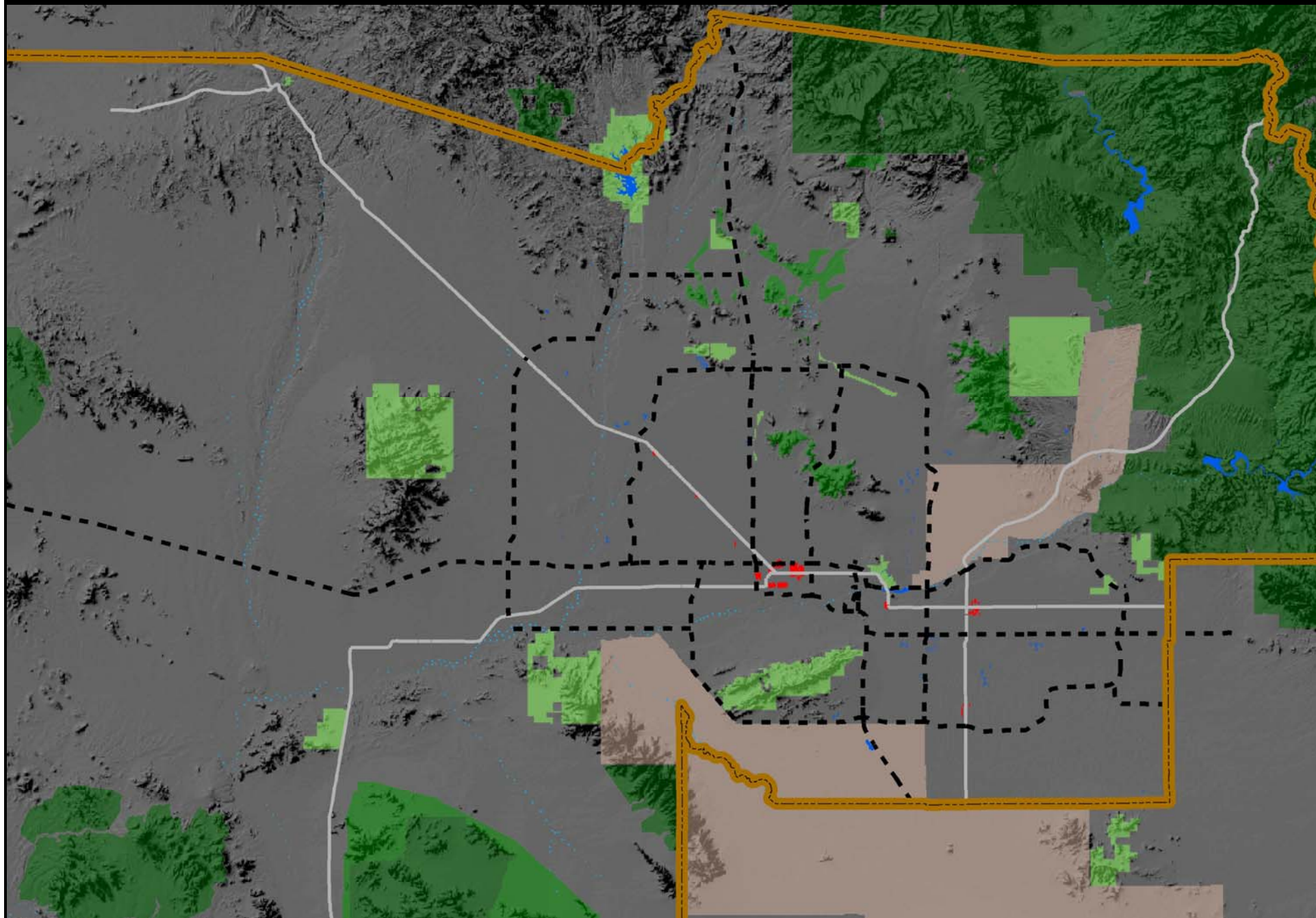




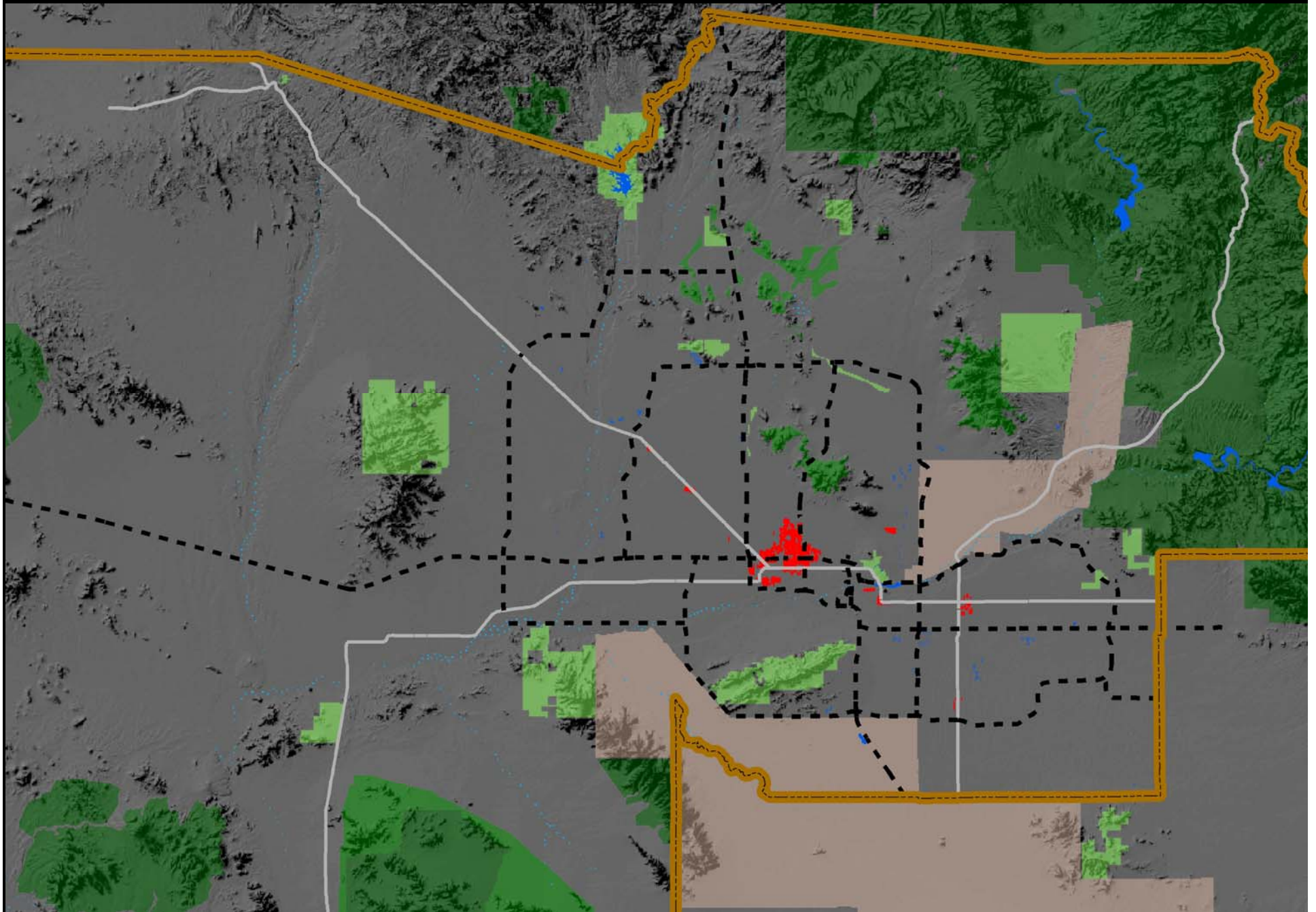
Projections for any Length Time Period

- **Process is iterative**
- **Output for one time period becomes input to the next**
- **All GIS coverages can be maintained for each time period**

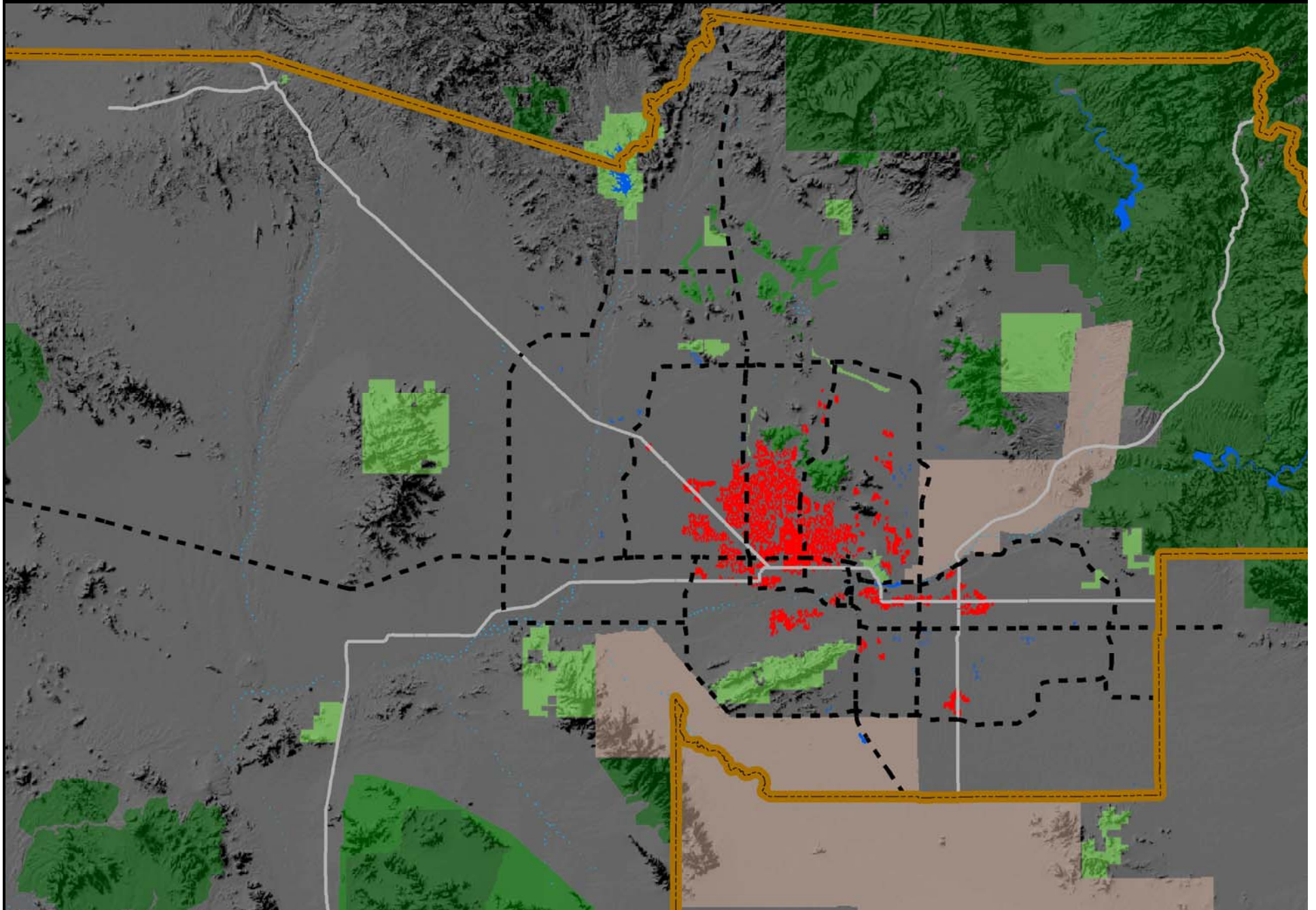
1912



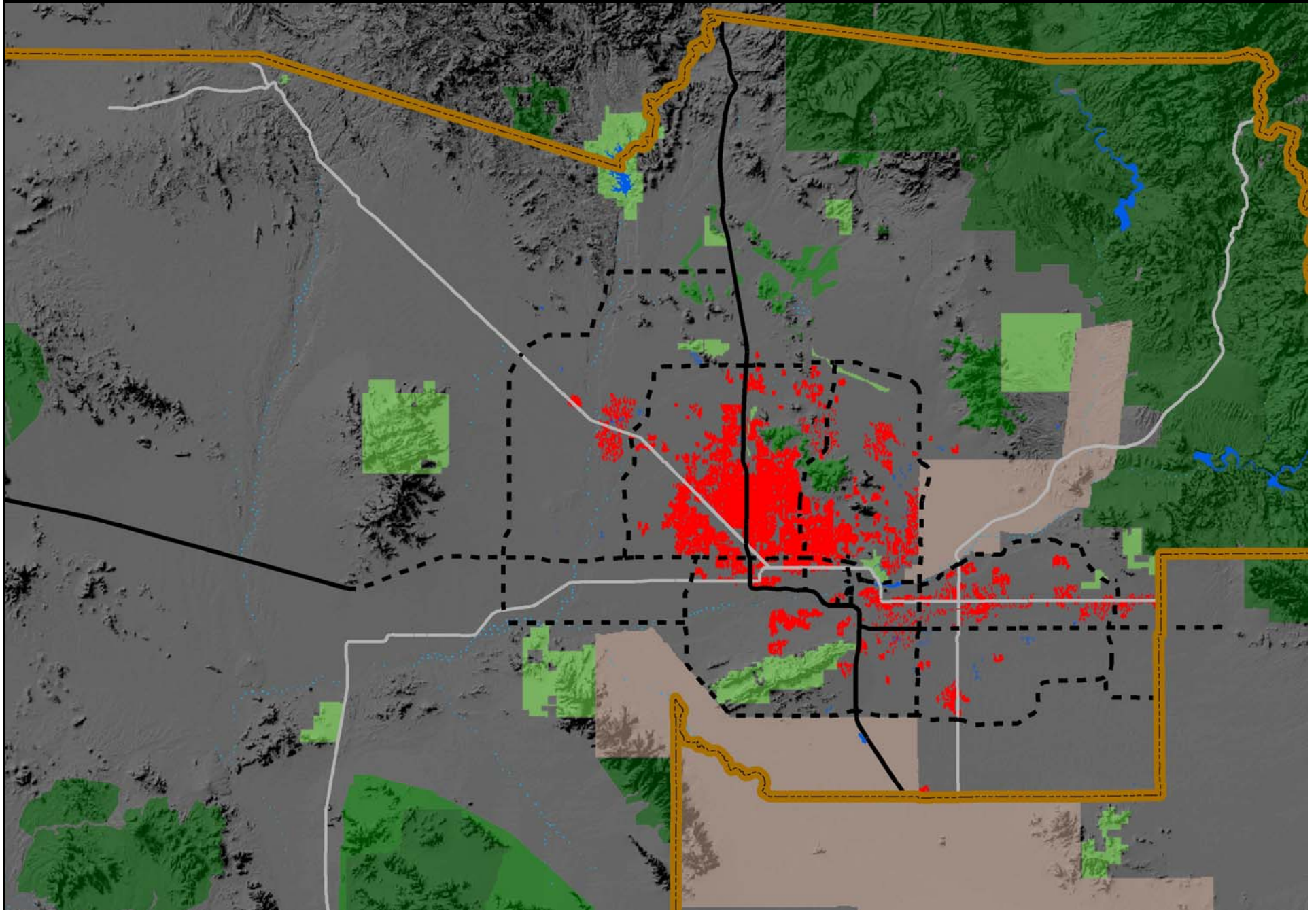
1934



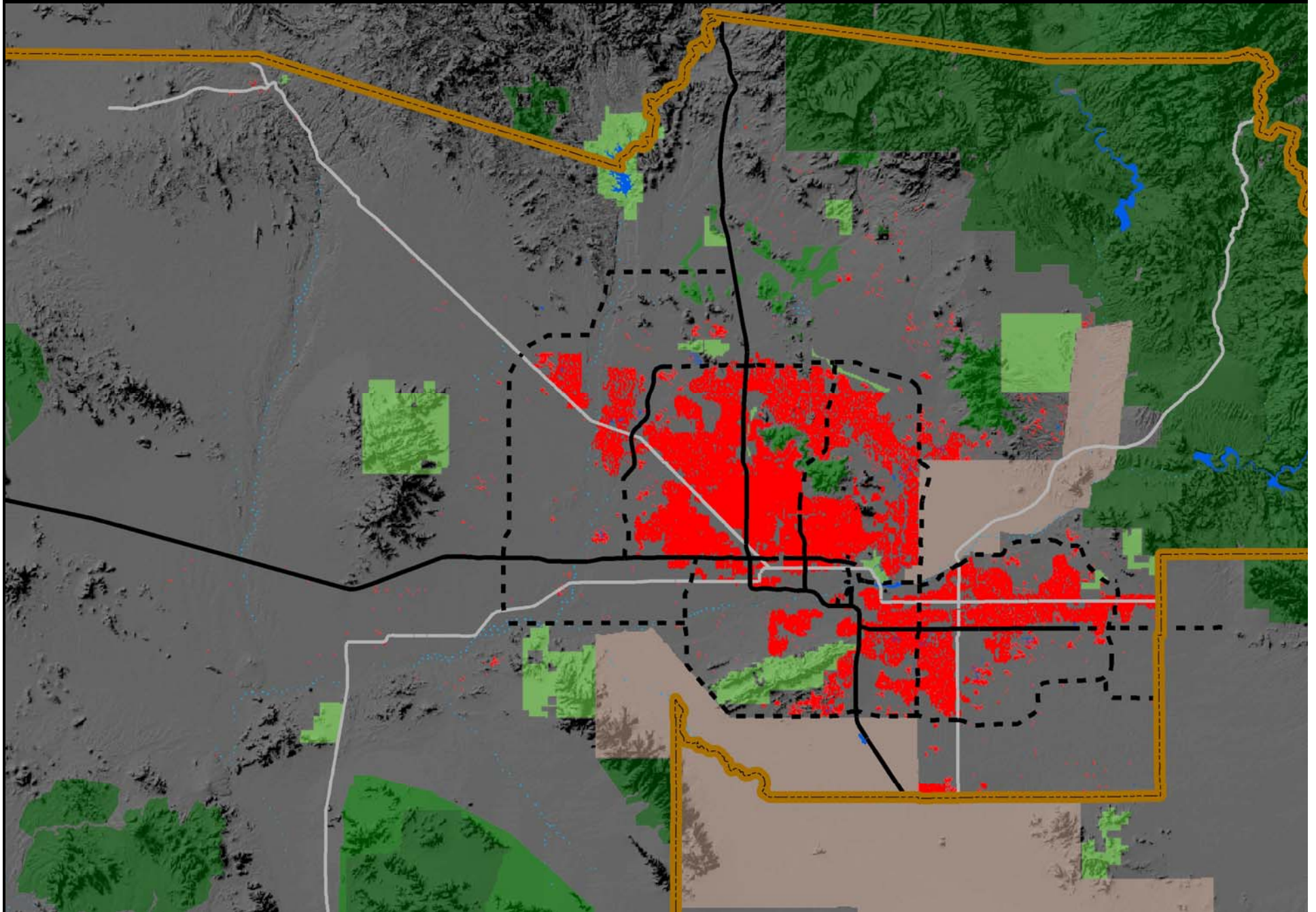
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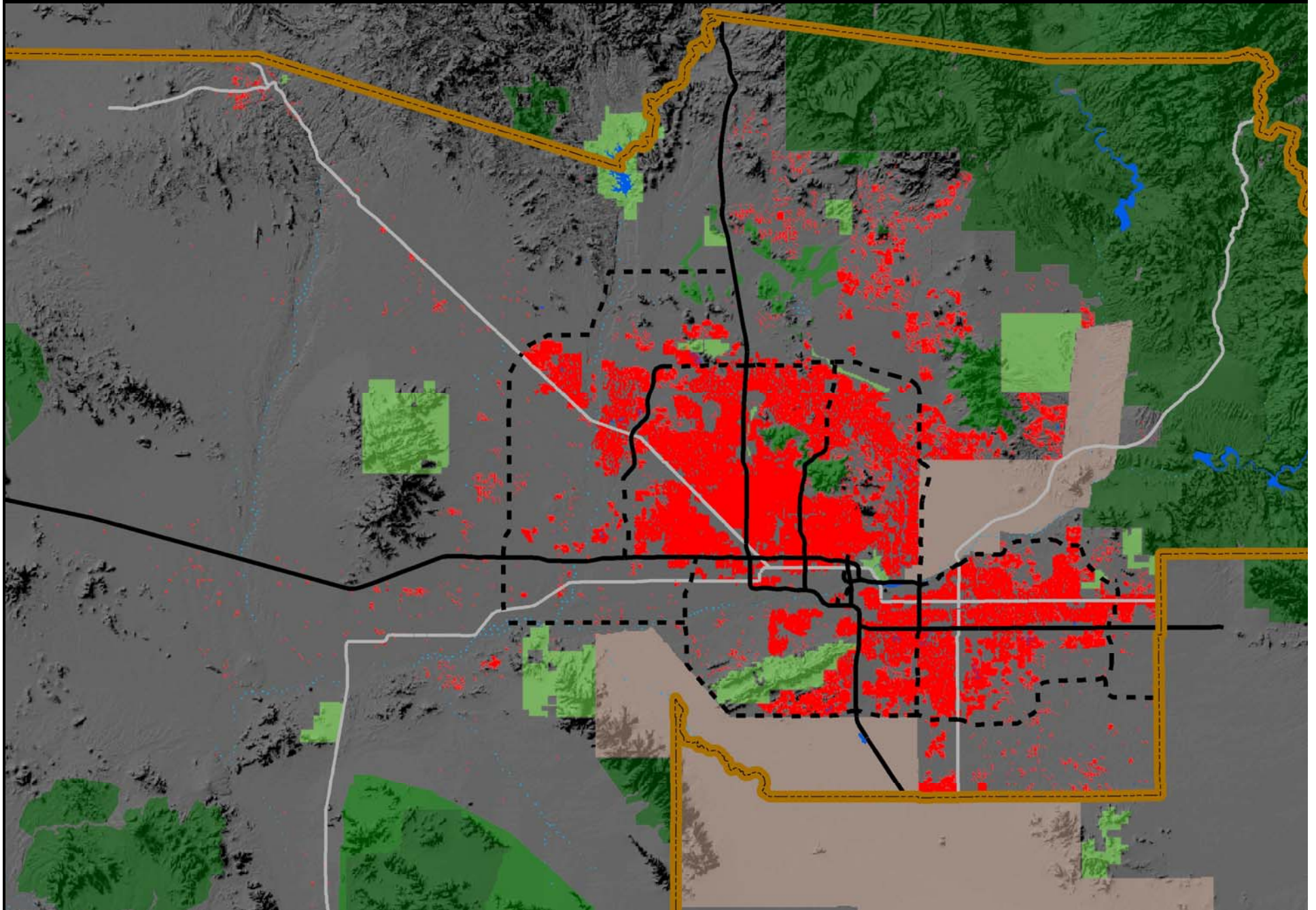
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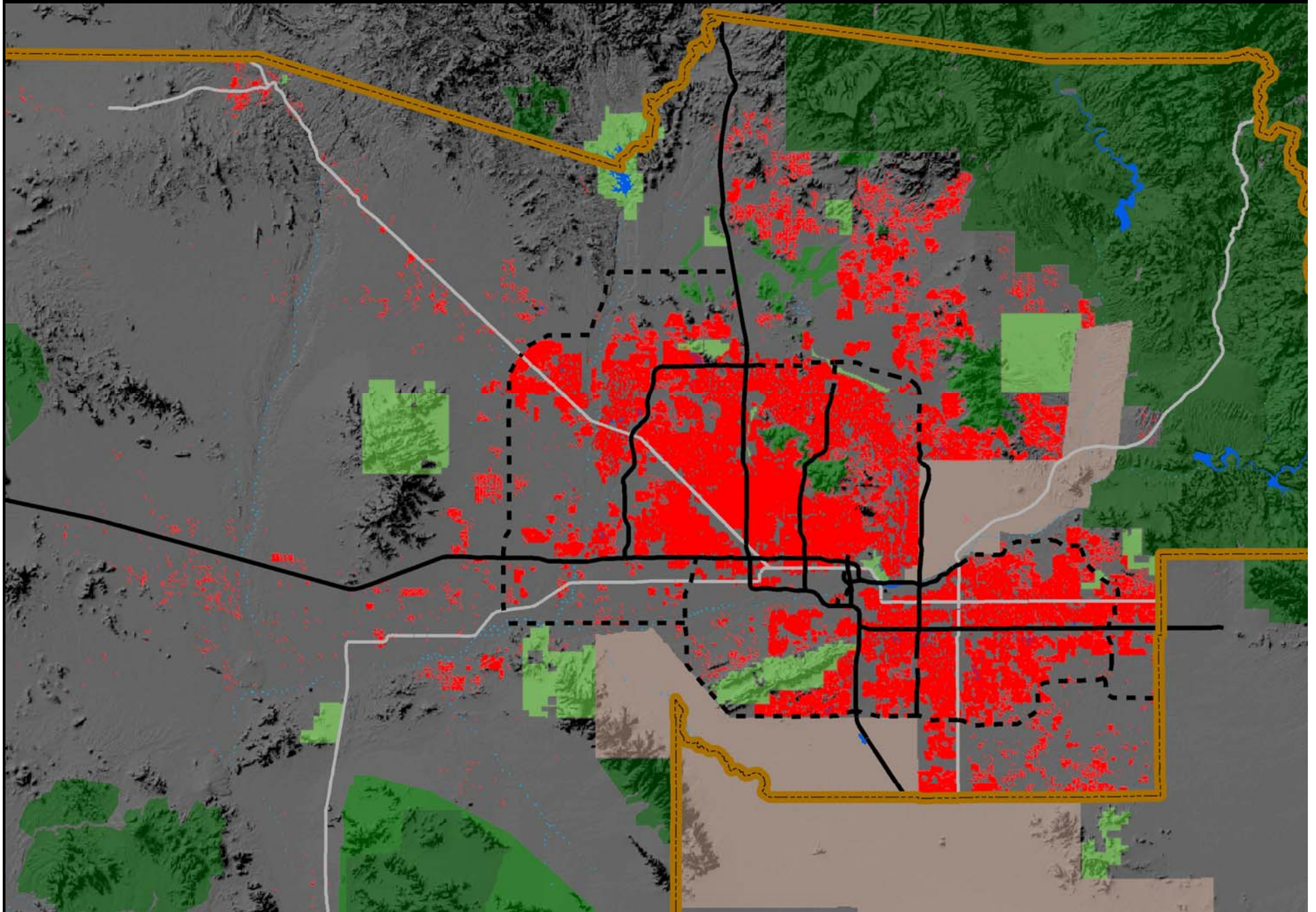
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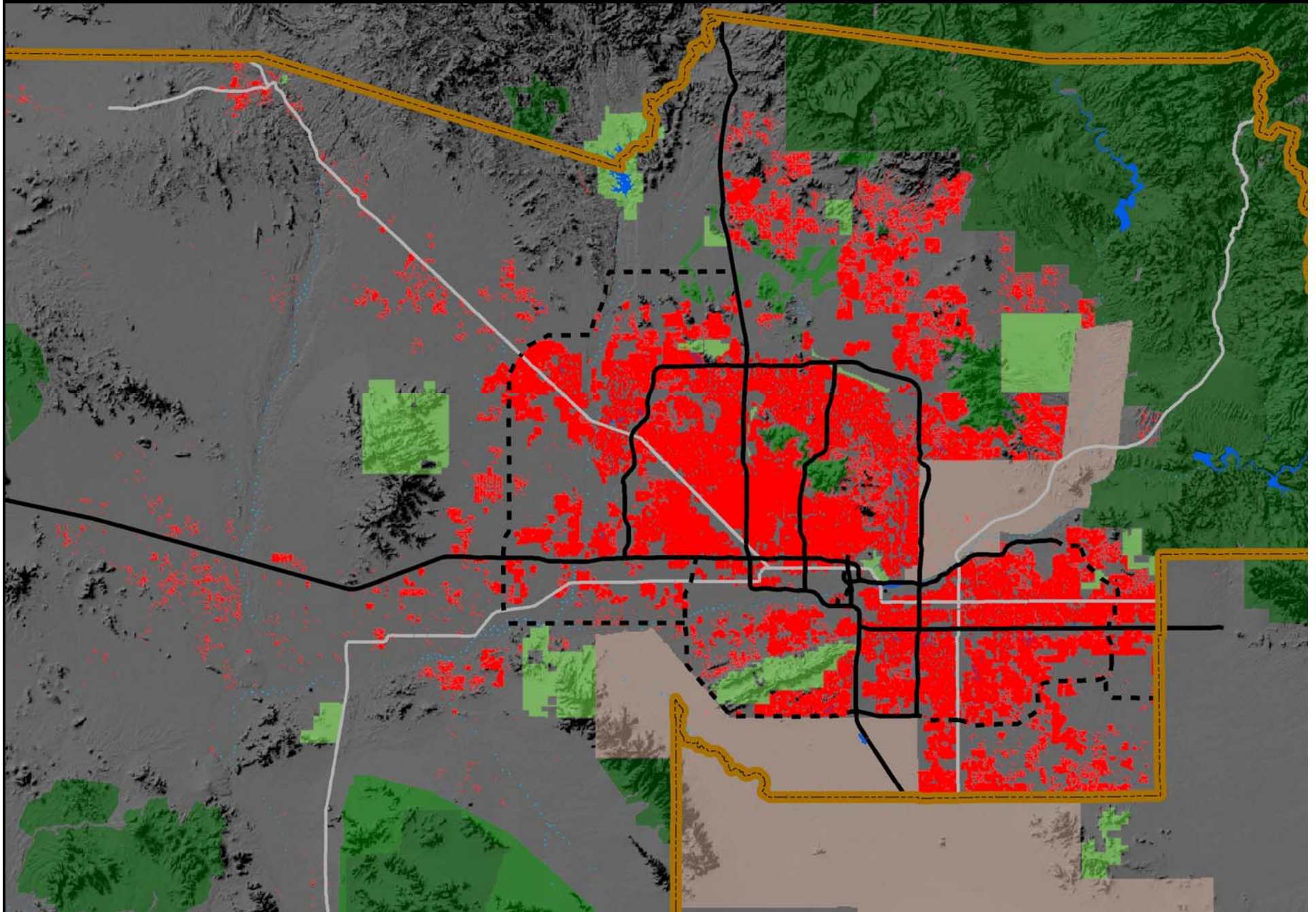
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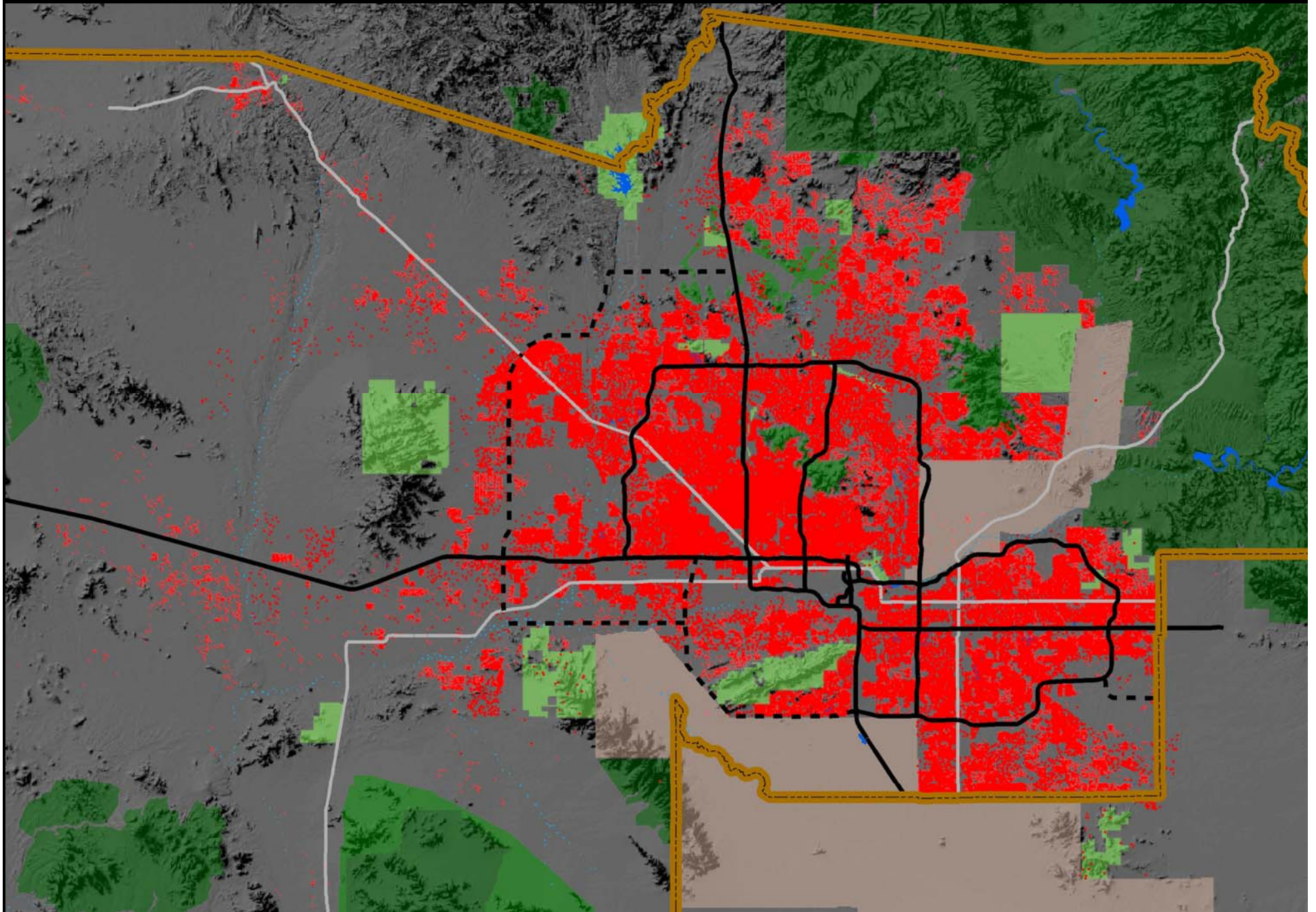
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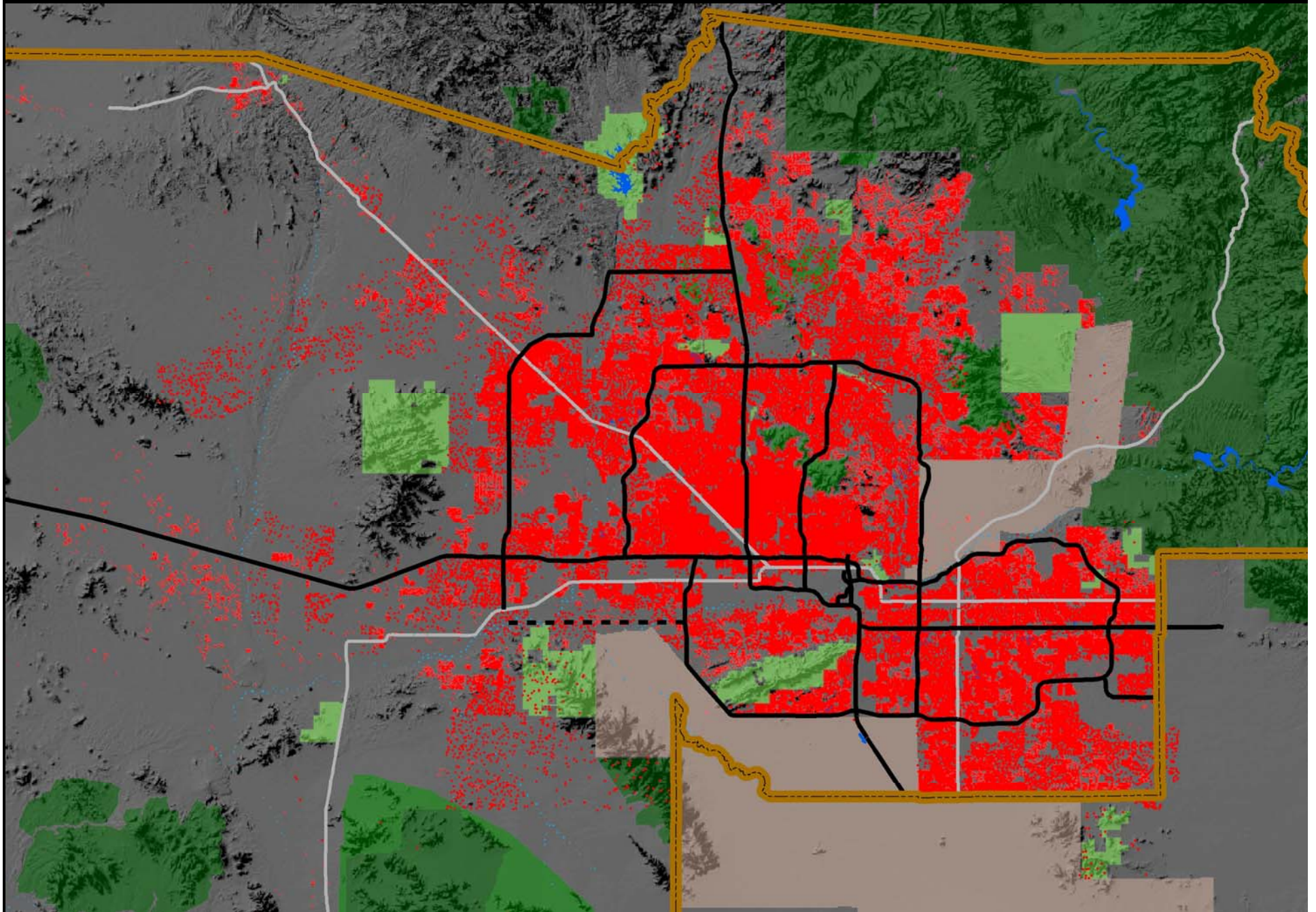
2003



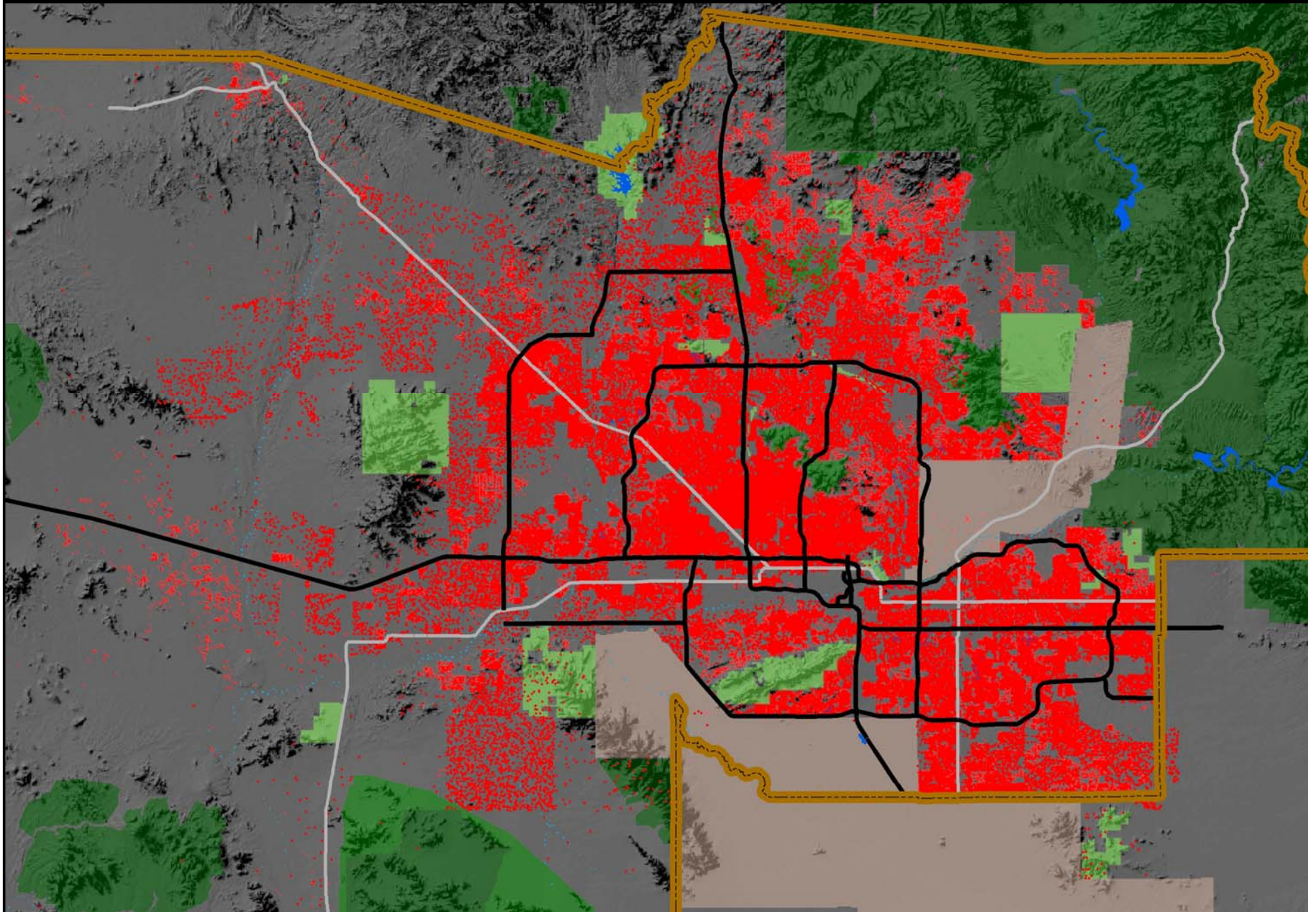
2010



2020



2030



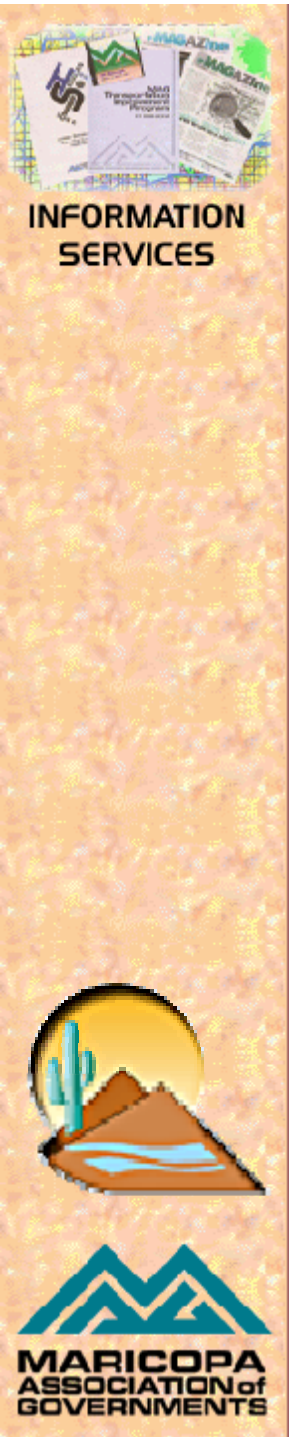


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Future Socioeconomic Projections Modeling



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AZ-SMART

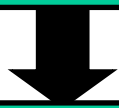
State Level Model



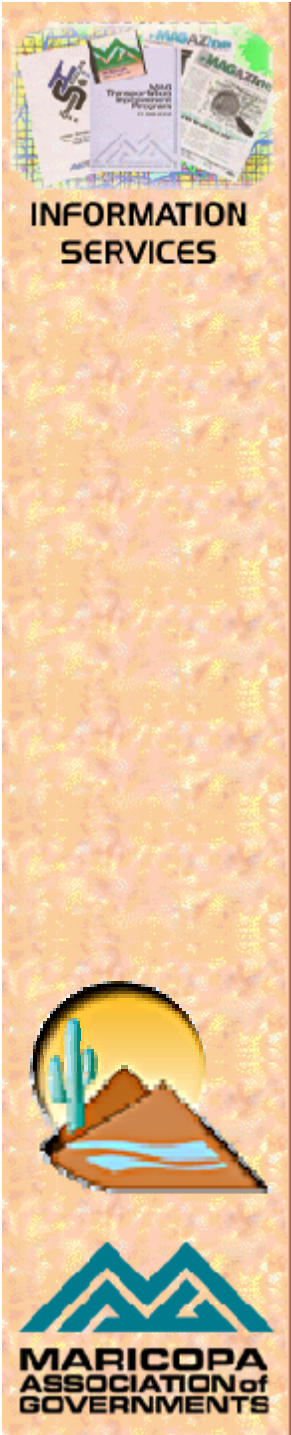
County Level/
Regional Models



Sub-regional
Models

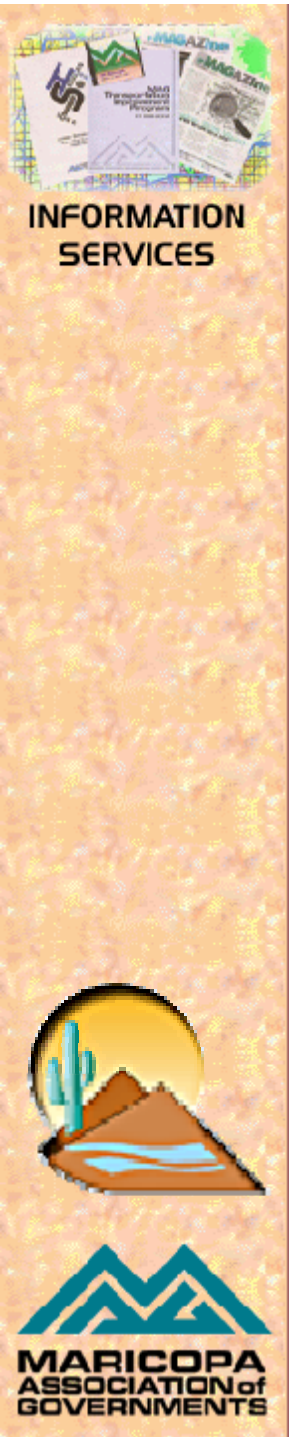


Small Area
Models



What It Is

- **Tools to create, edit, manage other tools**
- **Tools to model, analyze, summarize, visualize**
- **Ability to project land use, population, employment, other socioeconomic variables in GIS environment**
- **Different installations, different methodologies**
- **Module approach – plug and play**



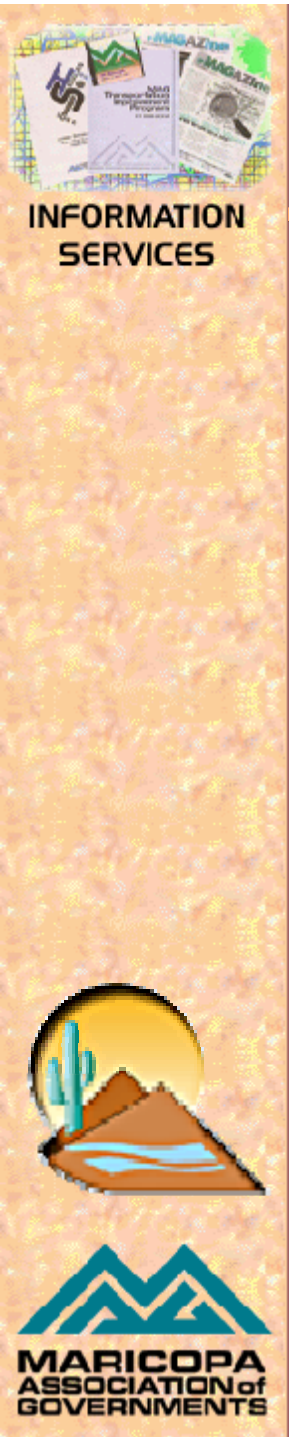
Projections on the Web

Interim Projections 2003

www.mag.maricopa.gov/detail.cms?item=2530

Documentation describing the projections process in detail

www.mag.maricopa.gov/detail.cms?item=2531



For More Information

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